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# THE TRAMWAY AND RAILWAY WORLD

AN ILLUSTRATED REVIEW OF PROGRESS IN
ELECTRIC AND OTHER TRACTION
WITH OMNIBUS AND COACH SECTION

Established in 1892

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LONDON, JULY 5, 1930.

## MUNICIPAL BODY BUILDING.

The present condition of industry intensifies the undesirability of allowing municipalities to build car and omnibus bodies. The greatest objection to such an extension of municipal activity is that it may end in the extinction of the private builder and the further spread of unemployment. Trade with foreign countries will certainly be adversely affected, as has been shown in the experience of British locomotive, coach and wagon-building firms. These companies are deprived of a large part of the home trade, with the result that their competitive power is lessened in foreign markets. Until a few years ago British railways placed twenty-five per cent. of their requirements with home manufacturers, but the percentage has dropped to eleven. The remaining 89 per cent. the railways build for themselves. The dual plea of economy and convenience was advanced when the railways took up this work, but although its volume was considerably increased as the result of the grouping and post-war needs the railway shops cannot be pointed to as models of activity, for short time appears to be the rule. Taking all the circumstances into consideration there is cause for congratulation that when the railways were given powers to operate omnibuses and to enter into agreements with existing undertakings the Legislature withheld authority to construct the vehicles. To have decided otherwise would have meant the gradual undermining of the large number of body builders who have greatly contributed to the popularity of the omnibus and coach. The sumptuous bodies of these vehicles have forced tramcar operators to give their patrons the comfort which is imperative if custom is to be retained. Before that awakening English municipalities possessing extensive repair shops for their tramcars had shown little inclination either to experiment or to improve their specifications, and the same remark would seem to be applicable to Glasgow, where for forty years the Corporation has been permitted to build tramcars. By their Parliamentary Bill of this year the powers have been extended to omnibus bodies, although the House of Commons has refused such applications by Birmingham, Leeds, Rotherham and Leicester. In view of the fact that Manchester also has similar powers (under which eleven omnibus bodies were built last year) it is difficult to see how the restriction can be maintained if the other local authorities become aggressive. In view, however, of the shorter life of an omnibus the municipalities should rest content with the facilities they possess for repairs. An extension to body building is not likely to be regarded with favour by the railways with whom road traffic agreements are being arranged.

## BUS AND TRAM COLLISION IN NORTH LONDON.

REPORT ON THE INQUIRY.

The report on the inquiry into the collision at Southbury-road, Ponders End, on December 11 between an electric tramcar of the Metropolitan Electric Tramways, Ltd., and an omnibus of the National Omnibus Co. has been published by the Stationery Office (price 3d.). In this accident four persons were fatally injured and eight passengers in the car and 18 in the omnibus suffered from shock or injuries. The drivers and conductors of both the vehicles were also injured.

Lieut.-Col. E. P. Anderson, who conducted the inquiry on behalf of the Ministry of Transport, gives it as his opinion that the collision was caused by the outward swerve of the omnibus which was probably following closely in the track of the car. The driver explained that he made the swerve owing to the necessity of avoiding a "wobbling" cyclist who had just been passed by the car in front of him. The cyclist had not come forward nor had he been identified. The inspector concludes that when the driver swerved he was about eight yards from the back of the car which he was following, and thinks that he swung out suddenly in front of the oncoming car and "straightened up" too late to avoid the collision. In swerving out as he had instead of pulling up the inspector is of opinion that he committed an error of judgment of a kind which was surprising in a driver of his experience. The possibility that the swerve was caused by sudden failure of the steering gear of the omnibus was disproved by the driver's statement that he made the swerve as well as by the nature of the fracture of the steering sector shaft, which showed that it was of sound and suitable material and dimensions and devoid of any flaw. There was nothing in fact to suggest its breakage before the shock of the collision. The speeds of both omnibus and tramcar had been underestimated by the men concerned. Having regard to the overturning of the car and the damage done to both vehicles, the inspector considers that they must have been running at 15 to 20 m.p.h., perhaps more. He could not accept the suggestion that the tramcar was derailed before the collision. In his opinion the leading bogie left the rails as a result of the shock and was swung round to an angle of perhaps 45 deg., the car naturally falling over in view of its speed. There was nothing to suggest any defect or abnormal unstability, and the track was in good order.

## ANGLO-ARGENTINE TRAMWAYS.

PROPOSALS TO RELIEVE BUENOS AIRES CONGESTION.

At the annual meeting of the Anglo-Argentine Tramways in London on Tuesday, Sir George A. Touche, Bart., chairman, said the decline in the company's transport revenue during the past year was due to depressed economic conditions and competition from omnibuses and taxibuses. Since 1928 omnibuses had increased from 600 to about 1,000 at the end of last year, and there were about 600 taxibuses. Of the total number of passengers using public street vehicles in 1929, it was estimated that 240,000,000 were carried by the omnibuses. Of these, about 27,000,000 would ordinarily have been taken by the company's lines, while probably a further 10,000,000 used taxibuses instead of the tramcars. No comprehensive measures had been taken by the authorities to ameliorate the acute congestion in the city streets. The real remedy lay in the widening of the streets, the building of underground railways, and the co-ordination of traffic.

The route for a third subway from Retiro to Constitucion was fixed by the municipality in December last. The agreement for the revision of tariffs was rejected by the Municipal Council in December, but a new scheme of even more comprehensive proposals had been submitted and was now under consideration. It aimed at a complete reorganisation of urban transport and had been formulated so as to relieve permanently the discomforts, delays and inconveniences arising from the present congestion. Its adoption would give Buenos Aires pride of place among those great cities which had perfected their traffic systems.

## NEW CARS FOR LEEDS.

The Leeds City Council, on the recommendation of the Tramways Committee, have just placed an order with the Brush Electrical Engineering Co., Ltd., Loughborough, for 100 double-deck, top-covered tramcars, of the latest up-to-date design, to be mounted on "Peckham" type flexible axle trucks. This contract represents a figure of something like £165,000.

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## CO-ORDINATING RAIL AND ROAD TRANSPORT.

A LIST OF THE ASSOCIATED COMPANIES.

Considerable progress has been made in the co-ordination of rail and road passenger traffic since the railway companies were granted powers to interest themselves in road traffic. The negotiations fall mainly under two headings: Those with municipal corporations and those with the principal road transport companies. The latter are controlled and directed by a few groups, the principal of which are: Tilling and British Automobile Traction and British Electric Traction Group, the National Omnibus and Transport Company, the Scottish Motor Traction Company and the National Electric Construction Company. Joint committees have been constituted to propose measures by which the services can best be co-ordinated. A list of omnibus and coach undertakings (company and municipal) with which the railways are concerned is appended:—

LONDON, MIDLAND & SCOTTISH RAILWAY.

*Associated Omnibus Companies:—*

Ayrshire Pullman Service.
Birmingham and Midland Motor Omnibus Co., incorporating: Black & White Motorways (jointly with Great Western Railway).
Crosville Motor Service, incorporating:—
Llandudno Coaching & Carriage Co.
Brookes White Services, Rhyl.
U.N.U. Motor Services, Carnarvon
Mona Maroon Services, Holyhead
Cumberland Motor Services.
Glasgow General Omnibus & Motor Services
Greenock Motor Co. and L.M.S. Joint Omnibus Services.
Highland Transport Co.
L.M.S. and Mansfield and District Tramways Co. (Joint Service).
Ribble Motor Services, incorporating:—
Rishton & Antley Motor Co.
Furness Omnibus Co.

The L.M.S. has also acquired an interest in Huddersfield Corporation Omnibuses.

The L.N.E.R. and L.M.S.R. are jointly interested in the following:—

East Midland Motor Services
Lincolnshire Road Car Co.
North-Western Road Car Co.
Ortona Motor Co.
Peterborough Electric Traction Co.
Trent Motor Traction Co.
West Yorkshire Road Car Co.
Yorkshire (Woollen District) Electric Tramways
Eastern National Omnibus Co.
Scottish Motor Traction Co., incorporating:
W. Alexander & Sons.
Scottish General Omnibus Co.
Scottish General (Northern) Omnibus Co.
Simpsons & Forresters.
Pitlochry Motor Co.
General Motor Carrying Co.
Midland Bus Services.
Hebble Omnibus Services

The L.N.E.R. and L.M.S.R. have jointly acquired an interest in the undermentioned municipal omnibus undertakings: Sheffield, Halifax and Leeds.

LONDON & NORTH-EASTERN RAILWAY.

*Associated Omnibus Companies:—*

Eastern Counties Road Car Co.
East Yorkshire Motor Services
Northern General Transport Co.
United Automobile Services

GREAT WESTERN RAILWAY COMPANY.

*Associated Omnibus Companies:—*

Western National Omnibus Co.
Western Welsh Omnibus Co.
Devon General Omnibus & Touring Co. (jointly with Southern Railway)
Bristol Tramways & Carriage Co.
City of Oxford Motor Services
Birmingham & Midland Omnibus Co. (jointly with L.M.S.)
Wrexham & District Transport Co.

SOUTHERN RAILWAY.

*Associated Omnibus Companies:—*

Aldershot & District Traction Co.
Devon General Omnibus & Touring Co. (jointly with the G.W.R.)
East Kent Road Car Co.
Hants & Dorset Motor Services
Maidstone & District Motor Services.
Southdown Motor Services
Southern National Omnibus Co.
Southern Vectis Omnibus Co.
Wilts & Dorset Motor Services

The co-ordination policy is taking definite form, and it is claimed that it provides certain advantages to the public, including inter-availability of return tickets by omnibus or rail; service arrangements to facilitate exchange of passengers between railway and road services; combination of railway and omnibus time-table matter and adjustment of services where possible to improve connections; employment of omnibus transport as extension of railway journeys for pleasure and other purposes; amplification of travel facilities by use of both forms of transport in combined tours.

## CHARGES AGAINST FORMER TRAMWAY MANAGER.

A case was opened at Plymouth Guildhall on July 1 in which charges of theft and falsification are preferred against Mr. H. P. Stokes, formerly engineer and manager of the Plymouth tramways. It is alleged that Mr. Stokes, who resigned his position at Plymouth to take up another appointment, had used Corporation labour and material for his own purposes. During the hearing Mr. Pearce, committee clerk to the Corporation, produced a resolution of the Tramways Committee stating that certain statements regarding the management of the Tramways Department had been investigated and the committee were satisfied that there was no foundation for these statements and that the Council be informed that in their opinion no further action was called for. Thursday's evidence largely concerned the use of defendant's motor car and work done on it. Defendant contends that the arrangement was that he should provide the car, pay for the licence and insurance, and that the department should provide petrol and maintenance. A witness who had acted as driver said that those who had any business on the Council with the tramways were driven in the car, and he supposed he had driven practically every councillor at one time or another.

## L.C.C. TRAMWAY MATTERS.

Following the Whitsun vacation, the meetings of the London County Council were resumed on Tuesday last. The Highways Committee recommended that the fee of the three medical advisers retained by the Council in connection with tramway claims, be increased from £2 2s. to £2 12s. 6d. for each attendance at Court for the purpose of giving evidence.

Widenings are to be made in Baring-road, between St. Mildred's-road and Grove-park station, at a cost of £27,300, and the Highways Committee has agreed to the allocation of one-third of the total to the tramway account. The tramway works will be put in hand as soon as the necessary property has been acquired.

## A RECORD YEAR AT BIRMINGHAM.

After deducting all charges including interest and sinking fund, etc., the Birmingham Corporation Tramways and Omnibuses show a balance of £270,963 for the year ended March 31 last. The gross profit rose by nearly £37,000, of which £35,000 was due to the increase in omnibus revenue. The revenue and profit constitute a record, but in considering the profit it should, the Committee states, be remembered that the policy of purchasing the omnibus undertaking out of revenue, although financially sound (as a considerable sum in interest has been saved), tends to obscure the financial position of the department, as neither depreciation nor loan charges appear in the accounts in respect of garages and vehicles, and this results in a much larger net profit being shown than would otherwise be the case. If the omnibus undertaking had been capitalised an additional charge of £102,896 would appear in the interest and sinking fund payments.

The subjoined table shows the number of miles run, the number of passengers, and the gross revenue, together with the figures for the preceding year:—

| | 1928-29. | 1929-30. | Inc. (+) or dec. (—). |
|---|---|---|---|
| Miles run— | | | |
| Tramways ... ... ... ... | 20,201,812 | 20,394,337 | + 192,525 |
| Omnibuses ... ... ... ... | 8,970,050 | 10,422,134 | + 1,452,084 |
| Trolley vehicles ... ... ... | 405,295 | 395,987 | — 9,308 |
| | 29,577,157 | 31,212,458 | + 1,635,301 |
| Passengers carried— | | | |
| Tramways ... ... ... ... | 243,008,582 | 246,819,134 | + 3,810,552 |
| Omnibuses ... ... ... ... | 81,070,647 | 99,881,142 | + 18,810,495 |
| Trolley vehicles ... ... ... | 6,119,906 | 6,357,290 | + 237,384 |
| | 330,199,135 | 353,057,566 | + 22,585,431 |
| Gross revenue— | £ | £ | £ |
| Tramways ... ... ... ... | 1,417,285 | 1,432,400 | + 15,215 |
| Omnibuses ... ... ... ... | 597,477 | 729,719 | + 132,242 |
| Trolley vehicles ... ... ... | 28,588 | 29,463 | + 875 |
| | £2,043,350 | £2,191,582 | + £148,232 |

The gross profit has been allocated as follows: Relief of rates, £40,000; renewals, £71,876; special expenditure, £159,087. Appropriation of profits has been made under three headings instead of two. This rearrangement, it is thought, makes clearer the fact that renewals to permanent way and rolling-stock are a recurring charge which should be borne by each year's revenue before any other appropriation of profits can be made. The total appropriation, viz., £270,963, is in excess of last year's figure by £27,292.

## PERSONAL.

**Mr. A. P. Fitzmaurice,** who was on the engineering staff of the British Electric Traction Co., Ltd., has retired owing to reorganisation in the engineering staff. Mr. Fitzmaurice joined the company in 1905.

**Mr. F. V. L. Mathias,** borough electrical engineer of Warrington, and Mrs. Mathias have been presented with a clock on the occasion of their silver wedding, the gift being from the staff and employees. Mr. Mathias is also electrical engineer to the tramways undertaking.

**Mr. C. E. Vance,** owing to the sale of various enterprises and the reorganisation of the engineering staff of the British Electric Traction Co., Ltd., has retired. Mr. Vance joined the B.E.T. in 1900 and had been assistant to Mr. C. W. G. Little, who retired in December last, during the greater part of that period.

**Mr. T. Peirson Frank** is recommended by a special committee for the appointment of chief engineer of the London County Council at a commencing salary of £3,000 a year. Mr. Frank has been city engineer at Liverpool for the past four years. Born in Huddersfield 44 years ago, he has held appointments in his native town and at Dewsbury, Ripon, Newark, Stockton-on-Tees, Plymouth and Cardiff. At Liverpool he has carried out several development schemes, and been responsible for new arterial roads and main bridges. He is also an experienced lecturer on civil engineering subjects.

**Sir George Touche, Bt.,** at a meeting of the Anglo-Argentine Tramways on July 1, announced his retirement from the chair. He said that when his colleagues asked him to become chairman on the death of Mr. Concanon he had already been advised to restrict his business activities on account of his health, and had stipulated that it should be for a limited period only. He had delayed his resignation while the fate of the ad-referendum agreement of 1925 was in suspense. That phase was now ended, and a new chapter was beginning which should be one of great development. He was glad to announce that the Duke of Athol had consented to become chairman.

In memory of the late **Mr. J. M. Strachan,** head of Strachan's (Acton), Ltd., London, W., two stained glass windows have been erected in the parish church of Cookney, Kincardine, his birthplace. Mr. Strachan, after working as a joiner in Scotland, settled in London, in the coachbuilding trade, and found an outlet for his inventive genius in various patents connected with coachwork. Ultimately he started in business for himself, and at the time of his death he was head of an undertaking that employed 600 workers in the building of bodies for omnibuses. Mr. Strachan figured largely in public life, and was a councillor on Kensington Borough Council. He gave a large sum of money for the building of a parish hall at Cookney and was distinguished by many other generous acts.

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## MISCELLANEOUS NEWS AND NOTES.

**Wages Increased.**—Chester Town Council has increased the pay of omnibus drivers from 1s. 1⅞d. to 1s. 2⅜d. per hour, and that of conductors from 1s. 0⅞d. to 1s. 1d.

**Bury Omnibus Garage.**—The sanction of the Ministry of Transport to borrow money for the erection of an omnibus garage, estimated to cost £7,500, has been received by Bury Tramways Committee.

**Scarborough Tramways.**—Mr. T. Hornsby, of United Automobile Services, has been unable to obtain the extension of his option to purchase the Scarborough tramways, and the suggested purchase by the Corporation has fallen through.

**Leyton and L.C.C. Agreement.**—Leyton Council has approved the supplemental agreement with the London County Council relating to the working of the Leyton tramways, which includes the provision by Leyton of fifty new cars.

**Future of Exeter Transport.**—Following a discussion by Exeter City Council on the relative merits of tramways and omnibuses, Mr. T. Hooper, chairman of the Transport Committee, said that they hoped to present to the next meeting a full report on the two methods. On the new omnibus service now running there is a small loss.

**Burnley Holiday Fares for Children.**—Burnley Tramways Committee has decided to allow children attending elementary schools to travel during the school holidays to various parks at reduced fares. The fares will be ½d. for any distance for which the ordinary fare is not more than 2d. and 1d. for any distance for which the ordinary fare is more than 2d.

**Municipal Printing of Tickets.**—The "Sheffield Independent" states that Mr. Percival Sharp, hon. controller of the municipal printing department of Sheffield, has stated that he is making preparations for the printing of tramway and omnibus tickets. The printing department is a new municipal enterprise, which was formally opened by Earl Russell.

**Damages Against East Ham Corporation.**—In Bow County Court on June 23 Mrs. A. Hoadley, a hawker, was awarded £225 damages, besides costs, against East Ham Corporation for personal injuries and loss of business caused by a tramcar. Her pony and cart were turning into Barking-road when the tramcar hit the cart, in which she was riding, and she was thrown out.

**Drivers and Conductors as Salesmen.**—During a discussion on losses on the Middlesbrough omnibus undertaking, Councillor Cooper suggested that drivers and conductors could do more to help the service by acting as salesmen, using greater vigilance to pick up passengers. It was decided to call a meeting of the staff and to appeal to them on this point.

**Memorial to Tramwaymen.**—A memorial to comrades who fell in the war was unveiled on June 24 at the Rochdale Corporation Employees' Social and Athletic Club. It is in the form of a tablet over the mantelpiece bearing the names of twenty men. The tablet was presented by Mr. Frederick Lye, who unveiled it, and Mr. G. Webster, general manager of the department, thanked Mr. Lye for the gift.

**Corporation Omnibuses for Private Tours.**—Bury Tramways Committee recently had an interview with representatives of the Commercial Motor Users' Association with respect to motor omnibuses being used by the Corporation for private tours. The Chairman and Deputy Chairman were subsequently appointed to discuss with the representatives of the Association certain suggestions received and to report to the Committee.

**Sheffield Transport Guide.**—The official handbook of the Sheffield Tramways and Motors extends to nearly one hundred pages, and is attractively produced. Full particulars are given of the tramway and omnibus facilities, and the provision of maps enables business and pleasure tours to be planned with ease. The widespread omnibus routes make possible a number of circular tours, with an interesting walk on a portion of the routes.

**Higher Fares at Oldham.**—Owing to the financial position of Oldham's transport undertaking, a special meeting of the Town Council on June 25 decided, on the recommendation of the Tramways Committee, to increase the minimum fare on tramcars and omnibuses from a penny to three-halfpence. It was also decided to adopt return tickets between 10 a.m. and 5 p.m., twopenny stages to be threepence and other stages in proportion.

**Wolverhampton Trolleybus System** was inspected by another deputation from Germany on June 23. The visitors included Herr G. G. Kemmann (consulting engineer, Berlin), Dr. Bracht (Mayor of Essen), and Herr W. Kern (general manager, Essen tramways). They were received by the Mayor (Councillor Alan Davies), who is chairman of the Transport Committee, and Mr. C. Owen Silvers (transport manager), and made a journey on one of the omnibuses. Two other deputations from the Continent who lately inspected the system returned highly gratified with its working, and it is probable that the system will be introduced in several German towns.

**Glasgow Transport Developments.**—The last contract for 100 double-deck omnibuses placed by Glasgow Corporation is now practically completed. The Corporation will soon have 230 omnibuses in service, but it is believed that a contract for a number of vehicles is contemplated. The management anticipate, it is said, that from 400 to 500 omnibuses will eventually be needed. Work on the extension of Larkfield garage is proceeding, and it is anticipated that the building will be ready for occupation before the end of the year. The extension will provide garage space for another 100 omnibuses, making a total of approximately 200 to be garaged at Larkfield. Inquiries are being made regarding the possibility of sites for the erection of other garages.

**Glasgow Councillor Vindicated.**—In a case heard in the Glasgow Sheriff Court on June 28, when Councillor P. J. Dollan sued Mr. Andrew G. Rennie, Junr., for £1,000 for alleged slander, it was stated in evidence that defendant had told three councillors and Mr. Tom Johnston, Under-Secretary of State for Scotland, that the Leyland Motor Co. had paid £10,000 to certain members of the Corporation, including Mr. Dollan, in order that they might obtain the contract for the construction of a large number of omnibuses. Sheriff Robertson held that the occasion was privileged, and Mr. Dollan was found liable in expenses. The Sheriff said that the statement was defamatory, but temperate, and no personal ill-will was proved. Mr. Dollan had vindicated his character completely, and defendant now admitted that Mr. Dollan was entirely innocent of every charge.

**Workmen's Fares at Birmingham.**—The question of workmen's fares was discussed by Birmingham City Council on July 1. Instructions had been given that the Tramways and Omnibuses Committee should report on a scale of cheaper return tickets. The committee suggested that the 6d. and 7d. workmen's return fares should be reduced to 5d. This would involve an estimated loss in revenue of £8,250, which would be increased to £21,000 per annum if the 5d. workmen's fares were also reduced to 4d. Alderman A. H. James called attention to the extensive commitments of the department, its obligations and heavy expenditure, and said that the committee felt they could not run below 5d. The concessions in the committee's proposal would enable passengers to travel from 17 to 18 miles for 5d. No one could claim that that was an excessive fare. The future gave some cause for anxiety because recently receipts had fallen off, the loss amounting to no less than £1,200 a week. He attributed the loss largely to trade depression and to the advent of the cheap motor car. In order to keep pace with the ever-growing omnibus traffic 75 omnibuses of the new type were on order and these would cost £130,000. Alderman James commended the policy of the department in buying omnibuses out of revenue. After a long discussion the amendments were defeated and the recommendations of the committee were approved.

## FINANCIAL.

**Exeter Corporation Tramways,** for the year ended March 31, show a gross profit of £14,226. Allowing for appropriations (income tax and loan charges, £6,359) there is a balance for renewals and reserve account of £7,867. The omnibuses show a gross profit of £1,660, but after accounting for appropriations there is a deficiency of £836.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended July 2 amounted to £84,298, an increase of £1,437 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to July 2 (13 2-7 weeks), the total receipts were £1,110,771, a decrease of £2,332.

**Gloucester City Transport.**—The accounts for the past year show a gross profit on the tramways of £4,004. After repayment of loans and other charges the balance carried forward is £1,878. The omnibus account, comprising six months' working, shows a gross profit of £2,279 and a balance carried forward of £952, after interest payment and the transference of £1,000 to reserve.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended June 14 give total receipts of £442,234, or £23,244 more than in the corresponding week of last year. The aggregate receipts for eleven weeks amounted to £4,634,221, an increase of £108,174 over the corresponding period of last year.

**Leicester Corporation Transport.**—For the year ended March 31 receipts from tramcars and omnibuses totalled £440,118, an increase of £21,080 on the previous year. Passengers numbered 69,391,245, an increase of 2,505,359, these being records. Omnibus revenue advanced by £19,572 and passengers by 2,446,522, the increase in mileage being 287,462. Tramway revenue was £2,670 more and there were 58,837 more passengers, although 74,791 fewer car miles were run. There was a net surplus of £25,444.

**Birkenhead Transport.**—For the year ended March 31 Birkenhead Corporation tramways made a gross profit of £14,826, against £24,913 in the previous year. After paying loan and other charges there is a surplus of £8,224, of which £4,375 has been appropriated by the Finance Committee, the balance going to redemption and renewal funds. The omnibuses made a gross profit of £64,715, compared with £54,257. After meeting certain charges there is a net profit of £32,710, as against £26,705. Of this £14,000 has been given to the rates and £11,000 to reserve account and sinking fund.

**Underground Interim Dividends.**—Interim dividends have been announced by the Underground Railways group for the half-year ended June 30, 1930, as follow:—Metropolitan District Railway: Ordinary Stock, 2½ per cent; London Electric Railway: Con. Ordinary Stock, 2½ per cent.; City and South London Railway: Con. Ordinary Stock, 2½ per cent.; Central London Railway: Undivided Ordinary Stock, 2½ per cent., Preferred Ordinary Stock, 2 per cent.; London General Omnibus Co., Ltd.: Ordinary Shares (free of tax), 3½ per cent.; Associated Equipment Co., Ltd.: Ordinary Shares (free of tax), 4 per cent.; Underground Electric Railways Co. of London, Ltd.: 6 per cent. First Cumulative Income Debenture Stock, 3 per cent.; 6 per cent. Income Bonds of 1948, 3 per cent., and Ordinary Shares, 3 per cent. In all cases the dividends are the same for the corresponding half of 1929.

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## CONTRACTS.

**Salford Tramways Committee** recommends the tender of Hadfields, Ltd., for the supply of a double tramway junction.

**Edgar Allen & Co., Ltd.,** were the successful tenderers to Leeds Tramways Committee for the supply of lay-outs and points.

**British Thomson-Houston Co., Ltd.,** is supplying gasfilled and vacuum lamps to the Office of Works during the period ending May 31, 1931.

**New Cars for Leeds.**—In addition to the contract mentioned elsewhere in this issue Leeds Corporation Tramways Committee has accepted the following tenders for tramcar equipments:—General Electric Co., Ltd., fifty electrical equipments at £590 per set; British Thomson-Houston Co., Ltd., fifty electrical equipments at £590 per set.

**Leeds Tramways Committee** has accepted the following tenders:—Six double-deck top-covered omnibus bodies, Charles H. Roe, Ltd.; Christopher Dodson, Ltd., six double-deck top-covered motor omnibus bodies; Dennis Bros., Ltd., five four-wheel double-deck top-covered motor omnibus chassis; Crossley Motors, Ltd., five four-wheel double-deck top-covered motor omnibus chassis; Leyland Motors, Ltd., two four-wheel double-deck top-covered motor omnibus chassis.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | June 24 | 616 | 521 | — 95 | 12 | 6,099 | — 178 |
| „ Motor Buses ... | „ 24 | 224 | 271 | + 47 | 12 | 3,475 | + 390 |
| „ Total ... ... | „ 24 | 840 | 792 | — 48 | 12 | 10,474 | + 212 |
| Aberdeen Corp. ... | „ 25 | 4,965 | 5,404 | + 439 | 3¾ | 19,331 | + 1,256 |
| Ashton-u-Lyne Corp. | „ 21 | 901 | 819 | - 82 | 12 | 10,300 | — 677 |
| „ Motor Buses ... | „ 21 | 488 | 458 | — 30 | 12 | 6,036 | + 51 |
| „ Trolley Buses ... | „ 21 | 280 | 246 | — 34 | 12 | 3,226 | — 176 |
| „ Total ... ... | „ 21 | 1,669 | 1,523 | — 146 | 12 | 19,562 | — 802 |
| Ayr Corporation ... | „ 28 | 588 | 561 | — 27 | 6 | 3,456 | — 194 |
| Barrow Corporation... | „ 30 | 633 | 591 | — 42 | 15 | 7,473 | — 480 |
| „ Motor Buses ... | „ 30 | 374 | 417 | + 43 | 15 | 5,055 | + 1,012 |
| „ Total ... ... | „ 30 | 1,007 | 1,008 | + 1 | 15 | 12,528 | + 532 |
| Belfast City ... ... | „ 27 | 11,356 | 11,637 | + 281 | 12¾ | 147,210 | + 6,582 |
| „ Motor Buses ... | „ 27 | 1,059 | 1,332 | + 273 | 12¾ | 17,266 | + 3,633 |
| „ Total ... ... | „ 27 | 12,415 | 12,969 | + 554 | 12¾ | 164,476 | + 10,215 |
| Birkenhead Corp. ... | „ 29 | 1,713 | 1,564 | — 149 | 13 | 20,530 | — 1,344 |
| „ Motor Buses ... | „ 29 | 3,452 | 3,686 | + 234 | 13 | 45,569 | + 3,333 |
| „ Total ... ... | „ 29 | 5,165 | 5,250 | + 85 | 13 | 66,099 | + 1,989 |
| Birmingham Corp. ... | „ 24 | 27,243 | 26,200 | — 1,043 | 12 | 325,320 | — 2,971 |
| „ Motor Buses ... | „ 24 | 13,272 | 15,426 | + 2,154 | 12 | 186,816 | + 35,114 |
| „ Trolley Buses ... | „ 24 | 560 | 536 | — 24 | 12 | 6,775 | + 171 |
| „ Total ... ... | „ 24 | 41,075 | 42,162 | + 1,087 | 12 | 518,911 | + 32,314 |
| Blackburn Corp. ... | „ 25 | 1,915 | 1,800 | — 115 | 12¾ | 22,997 | — 1,301 |
| „ Motor Buses ... | „ 25 | Nil | 306 | + 306 | 12¾ | 3,996 | + 3,996 |
| „ Total ... ... | „ 25 | 1,915 | 2,106 | + 191 | 12¾ | 26,993 | + 2,695 |
| Bradford Corporation | „ 28 | 14,869 | 14,697 | — 172 | 13 | 183,013 | — 9,890 |
| Brighton Corporation | „ 30 | 3,028 | 3,241 | + 213 | 12¾ | 33,512 | + 1,818 |
| Burnley Corporation... | „ 28 | 2,955 | 2,683 | — 272 | — | ... | — |
| „ Motor Buses ... | „ 28 | 634 | 670 | + 36 | ... | ... | — |
| „ Total ... ... | „ 28 | 3,589 | 3,353 | - 236 | ... | .. | — |
| Burton-on-Trent Corp. | „ 24 | 766 | 903 | + 137 | 12 | 10,199 | + 747 |
| Bury Corporation ... | „ 29 | 1,971 | 1,805 | — 166 | 12¾ | 23,872 | - 3,511 |
| „ Motor Buses ... | „ 29 | 444 | 1,070 | + 626 | 12¾ | 14,035 | + 8,986 |
| „ Total ... ... | „ 29 | 2,415 | 2,875 | + 460 | 12¾ | 37,907 | + 5,475 |
| Cardiff Corporation ... | „ 28 | 7,799 | 8,002 | + 203 | 12¾ | 99,921 | + 2,836 |
| Chatham and District | „ 26 | 1,272 | 1,241 | — 31 | 25 | 27,755 | + 1,221 |
| Chester Corporation ... | „ 29 | 430 | Nil | — 430 | 13 | Nil | — 5,824 |
| „ Motor Buses ... | „ 29 | Nil | 650 | + 650 | 13 | 8,409 | + 8,409 |
| „ Total ... ... | „ 29 | 430 | 650 | + 220 | 13 | 8,409 | + 2,585 |
| Chesterfield Corp. ... | „ 30 | 1,821 | 1,831 | + 10 | 13 | 24,180 | + 1,007 |
| Colchester Corp. ... | July 2 | 559 | 653 | + 94 | 14 | 8,039 | + 885 |
| Colne Corporation ... | June 25 | 678 | 713 | + 35 | 12 | 8,842 | + 96 |
| Coventry Corporation | „ 29 | 2,335 | 2,075 | — 260 | 13 | 26,737 | — 1,459 |
| „ Motor Buses ... | „ 29 | 1,684 | 1,857 | + 173 | 13 | 23,898 | + 3,405 |
| „ Total ... ... | „ 29 | 4,019 | 3,932 | — 87 | 13 | 50,635 | + 1,946 |
| Darlington Corp. ... | „ 28 | 962 | 1,030 | + 68 | 12¾ | 13,427 | + 1,107 |
| Derby Corporation ... | „ 28 | 2,496 | 2,403 | — 93 | 13 | 31,626 | — 436 |
| „ Motor Buses ... | „ 28 | 763 | 918 | + 155 | 13 | 11,767 | + 3,183 |
| „ Total ... ... | „ 28 | 3,259 | 3,321 | + 62 | 13 | 43,393 | + 2,747 |
| Dover Corporation ... | „ 28 | 424 | 438 | + 14 | 13 | 5,019 | + 185 |
| Dundee Corporation... | „ 10 | 2,624 | 2,736 | + 112 | 32 | 9,773 | — 610 |
| „ Motor Buses ... | „ 10 | 895 | 1,010 | + 115 | 3½ | 3,495 | + 279 |
| „ Total ... ... | „ 10 | 3,519 | 3,746 | + 227 | 3½ | 13,268 | — 331 |
| East Ham Corp. ... | „ 28 | 2,309 | 2,319 | + 10 | 12¾ | 29,622 | + 663 |
| Edinburgh Corp. ... | „ 21 | 14,421 | 15,410 | + 989 | 5¾ | 82,797 | + 1,425 |
| „ Motor Buses ... | „ 21 | 3,476 | 4,187 | + 711 | 5¾ | 21,402 | + 1,967 |
| „ Total ... ... | „ 21 | 17,897 | •19,597 | + 1,700 | 5¾ | 104,199 | + 3,392 |
| Exeter Corporation ... | July 2 | 892 | 855 | — 37 | 14 | 11,131 | -- 514 |
| Glasgow Corporation... | June 14 | 45,644 | 46,136 | + 492 | 2 | 92,544 | + 2,053 |
| „ Motor Buses ... | „ 14 | 5,355 | 8,713 | + 3,358 | 2 | 17,472 | + 6,851 |
| „ Total ... ... | „ 14 | 50,999 | 54,849 | + 3,850 | 2 | 110,316 | + 8,904 |
| Gloucester Corp. ... | „ 25 | 549 | 684 | + 135 | 12¾ | 8,618 | + 1,932 |
| Grimsby Corporation | „ 28 | 1,362 | 1,516 | + 154 | 13 | 19,442 | + 2,391 |
| Halifax Corporation | „ 24 | 4,498 | 5,215 | + 717 | 12¾ | 63,394 | + 7,305 |
| Huddersfield Corp. ... | „ 21 | 6,296 | 6,275 | — 21 | 12 | 76,302 | — 1,644 |
| Hull Corporation ... | „ 28 | 5,668 | 5,568 | — 100 | 13 | 74,486 | — 639 |
| „ Motor Buses ... | „ 28 | 1,326 | 1,483 | + 157 | 13 | 18,464 | + 1,650 |
| „ Total ... ... | „ 28 | 6,994 | 7,051 | + 57 | 13 | 92,950 | + 1,011 |
| Ilford Corporation ... | „ 28 | 1,631 | 1,572 | — 59 | 12¾ | 19,559 | + 383 |
| Ipswich Corp. Trol.Bus | „ 28 | 1,278 | 1,490 | + 212 | 12¾ | 16,935 | + 1,114 |
| Isle of Thanet ... | „ 25 | 1,220 | 1,201 | — 19 | 25½ | 13,006 | — 475 |
| Kilmarnock Corp. ... | „ 28 | 465 | 500 | + 35 | 6¾ | 3,145 | + 127 |
| Lancashire Un. ... | „ 22 | 2,241 | 2,061 | — 180 | 24¾ | 53,620 | — 2,446 |
| „ Motor Buses ... | „ 22 | 4,274 | 4,714 | + 440 | 24¾ | 118,012 | + 17,919 |
| Leeds Corporation ... | „ 28 | 20,274 | 20,522 | + 248 | 12¾ | 257,517 | + 7,736 |
| Leicester Corp. ... | „ 28 | 8,449 | 8,371 | — 78 | 13 | 108,103 | + 1,780 |
| Lincoln Corp. ... | „ 29 | 909 | 895 | — 14 | 13 | 11,958 | + 52 |
| Liverpool Corp. ... | „ 28 | 30,471 | 30,439 | — 32 | 12¾ | 385,998 | + 5,035 |
| London County Coun. | July 2 | 82,861 | 84,298 | + 1,437 | 13¾ | 1,110,771 | -- 2,332 |
| Luton Corporation ... | June 25 | 409 | 429 | + 20 | 12¾ | 5,373 | + 274 |
| Maidstone Corp. ... | „ 26 | 216 | Nil | — 216 | 12¾ | Nil | — 3,093 |
| „ Motor Buses ... | „ 26 | 264 | 296 | + 32 | 12¾ | 3,468 | + 2 |
| „ Trolley Buses ... | „ 26 | 288 | 585 | + 297 | 12¾ | 7,780 | + 3,968 |
| „ Total ... ... | „ 26 | 768 | 881 | + 113 | 12¾ | 11,248 | + 877 |
| Manchester Corp. ... | „ 28 | 36,093 | 33,100 | — 2,993 | 13 | 413,533 | — 37,044 |
| „ Motor Buses ... | „ 28 | 5,237 | 8,877 | + 3,640 | 13 | 109,773 | + 46,077 |
| „ Total ... ... | „ 28 | 41,330 | 41,977 | + 647 | 13 | 523,306 | + 9,033 |
| Middlesbrough Corp. | „ 24 | 1,095 | 1,009 | — 86 | 12¾ | 12,911 | — 831 |
| „ Motor Buses ... | „ 24 | 502 | 547 | + 45 | 12¾ | 6,873 | + 748 |
| „ Total ... ... | „ 24 | 1,597 | 1,556 | — 41 | 12¾ | 19,784 | — 83 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | | | £ | | £ | £ |
| Newcastle-on-Ty. Corp. | June 28 | 14,062 | 12,221 | — 1,841 | 12¾ | 114,154 | — 13,920 |
| „ Motor Buses ... | „ 28 | 2,611 | 4,186 | + 1,575 | 12¾ | 36,139 | + 9,767 |
| „ Total ... ... | „ 28 | 16,673 | 16,407 | — 266 | 12¾ | 150,293 | — 4,153 |
| Newport Corporation | „ 21 | 1,653 | 1,562 | — 91 | 12 | 19,147 | — 445 |
| „ Motor Buses ... | „ 21 | 723 | 773 | + 50 | 12 | 9,752 | + 934 |
| „ Total ... ... | „ 21 | 2,376 | 2,335 | — 41 | 12 | 28,899 | + 489 |
| Northampton Corp. ... | „ 27 | 1,101 | 1,069 | — 32 | 12¾ | 13,908 | — 342 |
| „ Motor Buses ... | „ 27 | 731 | 704 | — 27 | 12¾ | 9,240 | + 1,264 |
| „ Total ... ... | „ 27 | 1,832 | 1,773 | — 59 | 12¾ | 23,238 | + 922 |
| Nottingham Corp. ... | „ 26 | 6,569 | 5,779 | — 790 | 12¾ | 72,592 | — 9,852 |
| „ Motor Buses ... | „ 26 | 2,267 | 3,421 | + 1,154 | 12¾ | 41,006 | + 12,878 |
| „ Trolley Buses ... | „ 26 | 591 | 1,197 | + 606 | 12¾ | 15,043 | + 7,606 |
| „ Total ... ... | „ 26 | 9,427 | 10,397 | + 970 | 12¾ | 128,641 | + 10,632 |
| Oldham Corporation | „ 28 | 3,621 | 3,183 | — 438 | 14 | 46,848 | — 3,354 |
| „ Motor Buses ... | „ 28 | 2,047 | 1,865 | — 182 | 14 | 28,096 | — 207 |
| „ Total ... ... | „ 28 | 5,668 | 5,048 | — 620 | 14 | 74,944 | — 3,561 |
| Plymouth Corp. ... | „ 28 | 3,701 | 3,654 | — 47 | 12¾ | 46,208 | — 669 |
| „ Motor Buses ... | „ 28 | 1,912 | 2,448 | + 536 | 12¾ | 30,319 | + 6,541 |
| „ Total ... ... | „ 28 | 5,613 | 6,102 | + 489 | 12¾ | 76,527 | + 5,872 |
| Portsmouth Corp. ... | „ 28 | 6,722 | 7,453 | + 731 | 13 | 90,090 | + 12,527 |
| Preston Corporation... | „ 25 | 1,718 | 1,623 | — 95 | 12¾ | 20,528 | — 902 |
| „ Motor Buses ... | „ 25 | 480 | 504 | + 24 | 12¾ | 6,343 | + 425 |
| „ Total ... ... | „ 25 | 2,198 | 2,127 | — 71 | 12¾ | 26,871 | — 477 |
| Rawtenstall Corp. ... | „ 29 | 865 | 610 | — 225 | 12¾ | 8,730 | — 2,462 |
| „ Motor Buses ... | „ 29 | 569 | 681 | + 112 | 12¾ | 9,070 | + 2,171 |
| „ Total ... ... | „ 29 | 1,434 | 1,291 | — 143 | 12¾ | 17,800 | — 291 |
| Reading Corporation | „ 26 | 1,494 | 1,442 | — 52 | 13 | 18,027 | — 609 |
| „ Motor Buses ... | „ 26 | 981 | 1,025 | + 44 | 13 | 12,842 | + 1,624 |
| „ Total ... ... | „ 26 | 2,475 | 2,467 | — 8 | 13 | 30,869 | + 1,015 |
| Rochdale Corp. ... | „ 28 | 2,985 | 2,663 | — 322 | ... | 35,662 | — 3,147 |
| „ Motor Buses ... | „ 28 | 1,563 | 1,480 | — 83 | ... | 20,385 | + 805 |
| „ Total ... ... | „ 28 | 4,548 | 4,143 | — 405 | ... | 56,047 | — 2,342 |
| Rotherham Corp. ... | „ 30 | 2,649 | 2,722 | + 73 | 13 | 36,281 | + 1,937 |
| Salford Corporation ... | „ 29 | 11,252 | 11,543 | + 291 | 12¾ | 146,642 | + 2,856 |
| Sheffield Corp. ... | „ 28 | 20,830 | 20,010 | — 820 | 12¾ | 269,473 | — 1,058 |
| Southampton Corp. ... | „ 25 | 3,401 | 3,321 | — 80 | 13 | 41,982 | + 570 |
| „ Motor Buses ... | „ 25 | 804 | 855 | + 51 | 13 | 10,828 | + 1,920 |
| „ Total ... ... | „ 25 | 4,205 | 4,176 | — 29 | 13 | 52,810 | + 2,490 |
| Southend-on-Sea Corp. | „ 25 | 2,364 | 2,250 | — 114 | 12¾ | 25,068 | — 865 |
| „ Motor Buses ... | „ 25 | 169 | 316 | + 147 | 12¾ | 3,388 | + 1,570 |
| „ Total ... ... | „ 25 | 2,533 | 2,566 | + 33 | 12¾ | 28,456 | + 705 |
| Southport Corp. ... | „ 28 | 1,367 | 1,343 | — 24 | 12¾ | 16,672 | — 50 |
| „ Motor Buses ... | „ 28 | 392 | 427 | + 35 | 12¾ | 5,276 | + 616 |
| „ Total ... ... | „ 28 | 1,759 | 1,770 | + 11 | 12¾ | 21,948 | + 566 |
| St Helens Corp. ... | „ 24 | 1,867 | 1,938 | + 71 | 12¾ | 24,782 | + 1,916 |
| Sunderland Corp. ... | July 1 | 2,502 | 2,626 | + 124 | 13 | 32,624 | + 1,474 |
| „ Motor Buses ... | „ 1 | 296 | 620 | + 324 | 13 | 6,568 | + 4,982 |
| „ Total ... ... | „ 1 | 2,798 | 3,246 | + 448 | 13 | 39,192 | + 6,456 |
| Swindon Corp. ... | June 25 | 749 | 963 | + 214 | 12¾ | 12,182 | + 3,182 |
| Wallasey Corp. ... | „ 28 | 1,373 | 1,274 | — 99 | 12¾ | 15,969 | — 1,048 |
| „ Motor Buses ... | „ 28 | 2,251 | 2,455 | + 204 | 12¾ | 29,260 | + 3,529 |
| „ Total ... ... | „ 28 | 3,624 | 3,729 | + 105 | 12¾ | 45,229 | + 2,481 |
| Walsall Corporation... | „ 22 | 3,201 | 3,215 | + 14 | 12 | 42,461 | + 1,649 |
| Walthamstow Corp. ... | „ 28 | 2,567 | 2,502 | — 65 | 12¾ | 31,908 | + 116 |
| Warrington Corp. ... | „ 26 | 953 | 859 | — 94 | 13 | 11,523 | — 25 |
| „ Motor Buses ... | „ 26 | 488 | 484 | — 4 | 13 | 6,419 | + 664 |
| „ Total ... ... | „ 26 | 1,441 | 1,343 | — 98 | 13 | 17,942 | + 639 |
| West Ham Corp. ... | „ 26 | 5,921 | 6,027 | + 106 | 12¾ | 77,183 | + 2,252 |
| Wolverhampton Corp | | | | | | | |
| „ Motor Buses ... | „ 22 | 2,867 | 2,266 | — 601 | 12 | 29,506 | — 4,497 |
| „ Trolley Buses ... | „ 22 | 3,276 | 3,326 | + 50 | 12 | 42,820 | + 3,245 |
| „ Total ... ... | „ 22 | 6,143 | 5,592 | - 551 | 12 | 72,326 | — 1,252 |
| York Corporation ... | „ 25 | 1,104 | 1,085 | — 19 | 13 | 13,061 | + 550 |
| „ Motor Buses ... | „ 25 | 355 | 510 | + 155 | 13 | 6,304 | + 1,774 |
| „ Trolley Buses ... | „ 25 | 57 | Nil | — 57 | 13 | Nil | — 603 |
| „ Total ... ... | „ 25 | 1,516 | 1,595 | + 79 | 13 | 19,365 | + 1,721 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Wks. or *M* | Aggregate. 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | July 1 | £82,235 | £79,089 | 26 *w* | £2,187,639 | — £85,818 |
| Brazilian Traction $ | May. | 4,206,895 | 4,304,160 | 5 *m* | 20,139,475 | + 313,343 |
| British Columbia $ | May | 1,165,279 | 1,203,292 | 11 *m* | 13,514,147 | + 599,302 |
| Buenos Aires Lacroze | June 29 | 14,718 | 11,175 | 52 *w* | 609,255 | — 47,119 |
| Burma E. Sup. Co. Rs. | May | 66,077 | 66,320 | 10 *m* | 643,528 | — 22,026 |
| Calcutta ... Rs. | June 28 | 121,436 | 101,875 | 254 *w* | 2,926,168 | — 351,764 |
| Cape Town ... ... | May | 29,366 | 27,286 | ... | ... | ... |
| Carthagena & Herrerias | June | 1,476 | 515 | 6 *m* | 5,612 | — 209 |
| Durban ... ... | Apr. | 25,603 | 24,002 | 9 *m* | 214,538 | — 141 |
| East India ... ... | June | 3,772 | 3,803 | 11 *m* | 41,627 | + 438 |
| Kalgoorlie ... ... | Mar. | 1,082 | 1,710 | 3 *m* | 4,601 | — 45 |
| Madras (2 weeks) Rs. | June 30 | 42,660 | 42,076 | 24 *w* | 548,531 | + 28,473 |
| Para ... ... | May | 15,182 | 15,568 | 6 *m* | 88,779 | + 1,171 |
| Port Elizabeth ... | May | 7,601 | 7,552 | ... | ... | ... |
| Rangoon ... Rs. | June | 114,535 | 142,170 | 6 *m* | 899,635 | + 190,824 |
| Shanghai ... $ | May | 339,833 | 183,409 | 5 *m* | 1,555,971 | — 74,190 |
| Singapore ... ...$ | May | 133,000 | 148,000 | 8 *m* | 1,083,000 | + 123,000 |
| Winnipeg ... ...$ | May | 534,954 | 509,709 | 5 *m* | 2,793,546 | — 28,794 |

## RAILWAY RECEIPTS.

| 26th Week ended June 29th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 259,000 | — 20,000 | 322,000 | — 40,000 | 581,000 | — 60,000 | — 532,000 |
| L.M.S.R. | 606,000 | — 82,000 | 736,000 | — 88,000 | 1,342,000 | — 170,000 | —1,628,000 |
| L.N.E.R. | 418,000 | — 9,000 | 598,000 | — 97,000 | 1,016,000 | — 106,000 | — 829,000 |
| S.R. | 366,000 | — 17,000 | 111,000 | — 18,000 | 477,000 | — 35,000 | — 136,000 |
| Totals | 1,649,000 | — 128,000 | 1,767,000 | — 243,000 | 3,416,000 | — 371,000 | -3,125,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | June 28 | 309,300 | 326,500 | + 17,200 | 7,807,900 | + 527,700 |
| Loud. & Sub. Group | „ 28 | 45,300 | 47,200 | + 1,900 | 1,136,800 | + 90,900 |
| Metropolitan Railway | „ 28 | 37,300 | 37,900 | + 600 | 956,300 | + 25,000 |
| Liverpool Overhead | „ 29 | 1,828 | 1,742 | — 86 | 39,508 | — 2,278 |
| Mersey Railway ... | „ 28 | 3,964 | 4,081 | + 117 | 115,909 | + 4,009 |

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LONDON, JULY 12, 1930.

## THE OUTLOOK FOR THE ROAD TRAFFIC BILL.

There is now every prospect that the greatly needed Road Traffic Bill will become law before Parliament rises next month. As a result of consideration by the Standing Committee of the House of Commons and of the restoration of the omnibus powers of which the municipalities were deprived by the House of Lords, the Bill will be returned to the Upper House practically as an agreed measure. Part V was restored in Committee without opposition, and on July 4 the Bill came before the Commons on the report stage, with only one really controversial point among the thirty pages of amendments on the paper. The debatable point was the abolition of the speed limit for light motor cars. An amendment to impose a limit of 35 m.p.h. was defeated by 180 votes to 99 after the Minister had announced his intention of introducing a clause giving him power to contribute from the Road Fund towards the establishment of a mobile body of police to check dangerous driving. Automobile interests have since expressed objection to the use of the Road Fund for that purpose, but it is clear that public opinion is in favour of the proposal. On Thursday last the House accepted the clause which restricts speed of heavy passenger vehicles to 30 m.p.h. The Commercial Motor Users' Association asked for a limit of 35 m.p.h. in view of the higher rate now attained by coaches outside of the towns. The problem was solved by the Minister accepting an amendment to allow the speed limit to be varied by regulations to be approved by both Houses of Parliament. The greatest check on speed will be the timetables that will have to be submitted to the Area Commissioners when vehicles are presented for licensing. The Bill is particularly welcome to municipal operators of public passenger vehicles because the Commissioners to be appointed under it will be able to secure a reasonable degree of co-ordination, and to reduce the present chaos in passenger road transport to something like order. The Minister deserves the thanks of all operators of public vehicles for the work he has done. As he remarked in his speech on Wednesday at the dinner of the Association of Municipal Corporations, the Bill as it now stands will greatly assist in promoting transport efficiency, justice, and economy.

## TRACTION BILLS IN PARLIAMENT.

### TORQUAY BILL REJECTED IN THE COMMONS.

The Torquay and Paignton Tramways Bill, which sought to substitute trolleybuses for tramways, and had passed through all its stages in the House of Lords, was discussed in the House of Commons on July 7. Mr. McKinlay (Lab.) moved its rejection on the ground principally that it deprived the ratepayers of Torquay of the option to purchase the tramways undertaking in 1935. A minimum fare of 1½d. was proposed and there were to be no workmen's fares. Mr. Oliver, who seconded, said it would cost Torquay £250,000 to purchase the tramways. Such an opportunity would occur in 1935 if the Bill were rejected. If the Bill passed that opportunity would be deferred until 1951.

Mr. Morrison, Minister of Transport, said it was unfortunate that this Bill had been allowed to go through its second reading without opposition; opposition at the present stage was unusual.

The motion for the rejection of the Bill was carried by 222 votes to 109.

### NO PROTECTION FOR OUTSIDE SERVICES AT STOCKTON.

The Stockton-on-Tees Corporation Bill seeking further transport powers, on Tuesday came before a Select Committee of the House of Lords, presided over by Lord Meston. It was opposed by local omnibus companies and by the London and North Eastern Railway. The Bill seeks power to start new omnibus routes in Stockton, Middlesbrough and Thornaby-on-Tees, which the Council asked should be protected against competition, and also to operate omnibus services on special occasions within a radius of thirty miles. The Committee decided to allow the Bill to proceed on condition that the clauses relating to protection and special services were struck out.

The Committee also heard evidence last week, when Mr. Arthur Moon, K.C., for the promoters, said that an expert had strongly advised that the tramway system, which was operated jointly by the three Corporations, should be converted into omnibus services. These would be worked by Stockton and Middlesbrough, and Stockton would take over the services allocated to Thornaby, which had no power to run omnibuses.

Mr. Harry England, managing director of the Yorkshire and West Riding Electric Tramways Co., said that when he was called in by Stockton Corporation to advise them, he gave the opinion that it would be economically hopeless and foolish to try to continue the tramways in view of the large amount of capital expenditure required and the decrease in through traffic.

Alderman F. T. Naltrass, Mayor of Stockton, referring to the special powers asked for to run special omnibuses to places of interest and seaside resorts within thirty miles, said that the occasions they had in view were when a large number of omnibuses would be idle. There was no intention of running regularly to race meetings.

## SUCCESS OF BELFAST TRAMWAYS.

Belfast Corporation some time ago made an omnibus agreement, which limited the competition of private omnibuses, and since then there has been a marked increase in the tramway receipts. At a recent meeting of the Corporation, Councillor McClure, chairman of the Tramways Committee, said that the Corporation was agreed that the results of the year's working were most satisfactory, and he was sure that the public would agree with him. 'When Mr. Chamberlain, the general manager, took up duty in December, 1928, there was a loss of £17,000, which was being increased by about £2,000 a week. Under his management, that year had ended with a profit of £10,000 on the tramways, although the loss on the omnibuses reduced it to a profit of £1,400. With a reduction in fares and a number of cross stages, they were now running at 16.5d. per mile instead of 18.25d., as at the end of March, 1928, which was the last previous normal year. For the past year there was a profit of £92,000. Unfortunately there was a loss on the omnibus services of £20,000. They knew that at the low fares being charged there would be a great loss, and the Committee intended to apply to the Fares Tribunal for authority to increase the fares. The manager, Councillor McClure intimated, was considering the idea of an extension of all the tramway stages and possibly a universal penny fare in the future.

## CHARGES AGAINST A MANAGER DISMISSED.

The proceedings against Mr. H. P. Stokes, formerly engineer and manager of Plymouth tramways, concluded on Saturday, the fifth day of the hearing, when the justices dismissed all charges of larceny, etc., without hearing the defence. The presiding magistrate, Dr. W. E. M. Corbet, in giving the decision of the Bench, said that it was common knowledge that many of the perquisites Mr. Stokes was alleged to have succeeded in obtaining were allowed expressly or tacitly to the heads of large commercial undertakings. Another matter which must be given its due weight was that Mr. Stokes made no attempt to make any secret either of what he was doing or what was being done on his behalf. With regard to the charges against him for the upkeep and maintenance of his cars and the use of a Corporation employee as driver they were satisfied beyond doubt that Mr. Stokes considered that he had a right to these, and this being so, a criminal charge must fail. In fairness to Mr. Stokes, it must be pointed out that his cars were in constant use for corporation purposes. They could find no evidence at all in support of the charge of fraudulent conversion. They had considered at great length the evidence in regard to charges of less gravity, and had satisfied themselves that such evidence did not justify them in committing Mr. Stokes for trial.

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## THE ROAD TRAFFIC BILL.

NO SPEED LIMIT FOR LIGHT CARS.

The House of Commons on July 4 rejected by 180 votes to 99 an amendment moved by Dr. Salter (Lab.) to impose a speed limit of 35 m.p.h. for motor cars. The Bill prescribes no limit on the speed of cars that carry not more than seven passengers, exclusive of the driver. In support of his amendment Dr. Salter said that the London County Council desired a speed limit for the Metropolitan area. The Minister of Transport opposed the amendment, and said that he intended to introduce an amendment to enable provision to be made out of the Road Fund towards providing the police with motor vehicles to deal with the dangerous driver.

The Minister of Transport moved an amendment, which the House accepted, bringing trolleybuses under the provisions of the measure while still excluding tramcars.

The House devoted much of last Thursday's session to the remaining stages of the Bill. Good progress was made, and Mr. Morrison took legitimate pride in saying that he had never yet moved the closure during the discussions on the Bill.

On Clause 10, which deals with the rates of speed for commercial and heavy vehicles, Col. Ashley moved an amendment to empower the Minister of Transport, by regulation to be approved by both Houses, to vary the speed limit in schedule 1 for commercial and heavy vehicles. He thought the Minister ought to have this power of variation, because it was impossible to say what would be the appropriate speed ten or fifteen years hence. Mr. Morrison accepted the amendment.

Col. Howard Bury wished to debar conviction for dangerous or careless driving on the uncorroborated evidence of a single witness.

Col. Ashley pointed out that speed was an element in a charge of dangerous driving, but only when speed was so great as to be dangerous was corroborative evidence not required.

The Solicitor-General refused, however, to put an accused motorist in a more privileged position than other persons on trial.

Major Hill supported the Solicitor-General, because on the abolition of the speed limit greater severity would be shown towards dangerous driving. He pointed out that conviction did not rest on the fiat of a witness but on the opinion of the court.

The amendment was defeated by 273 votes to 140. The House also refused to relax the power to charge drunken drivers, and maintained the culpability of being drunk in charge of a car even though the accused was not actually driving it.

Mr. Morrison refused to relax in respect to trailers, and foreshadowed a regulation reducing the trailers permitted to a light tractor from three to two.

A further amendment was agreed to at Mr. Buchan's suggestion that Universities should be among the authorities on the application of which the Minister might make orders regulating traffic. Various other amendments were defeated, and when the House had completed consideration of all the clauses up to and including Clause 75 further consideration of the Bill was adjourned.

## MINISTER OF TRANSPORT ON THE PART V COMPROMISE.

Mr. Herbert Morrison, Minister of Transport, speaking at the annual dinner of the Association of Municipal Corporations in London, on July 9, congratulated the Association and its colleagues of the Municipal Tramways and Transport Association on being within sight of securing those wider powers for municipal transport undertakings for which they had fought for many years. Under the old conditions a municipality had worked under a great disadvantage as compared with private enterprise. The new order of things embodied in the Road Traffic Bill had become essential. The municipalities would be no longer licensing authorities, as Traffic Commissioners were to be set up in their place. The new provisions were going to be an important factor in co-ordination between various public transport undertakings and private undertakings. The outstanding duty of the Traffic Commissioners would be co-ordination, and the municipalities could appear before them on a basis of equality with private undertakings and with the necessary elastic powers to make working agreements not only between municipality and municipality, but between municipality and private undertaking. He, therefore, believed that Part V of the Bill, taken in conjunction with Part IV which dealt with the regulation of public service vehicles, would be a great inducement to transport efficiency, justice and economy. Although neither private undertakings nor the municipalities and himself were entirely satisfied with all the details of the arrangement, they had arrived at a compromise which, in the judgment of all of them, was reasonably fair. In view of the compromise he was now confident not only that the House of Commons would pass Part V of the Bill but that the House of Lords would enter into the spirit of the agreement and let it stand in its revised form as part of the Bill, which as a whole would constitute a great legislative milestone and do much for the better organisation and safety of traffic on the roads.

## NEW TRAMCARS FOR NORTH LONDON.

At a meeting of Middlesex County Council on June 26, Mr. W. B. Pinching, chairman of the Light Railways and Tramways Sub-Committee, in reply to complaints of the tramway services to Alexandra Palace, said that his committee had just approved the construction of 54 new tramcars, which would be in commission before Christmas and would greatly improve the service of Metropolitan Electric Tramways, Ltd. The double-deck cars now in use were too high to pass under certain bridges, but the company was reducing the height by two inches.

## L.C.C. TRAMWAY MATTERS.

NEW PLANT FOR GREENWICH POWER STATION.

At the meeting of the L.C.C. on Tuesday it was decided, on the recommendation of the Highways Committee, to spend £450,000 on extending and replacing plant at Greenwich power station. The plant to be installed is :—

(A) Twelve water-tube boilers and auxiliaries, each of approximately 50,000 lbs. an hour evaporative capacity and suitable for supplying steam at 500 lbs. a square inch at a temperature of about 750 degrees Fahrenheit.

(B) Two 20,000 kilowatt (maximum rating) high pressure turbo-alternators with condensing plant and auxiliaries.

The changes proposed will increase the capacity of the plant by 25,000 kw., and the Committee is satisfied that the additional energy can be generated at the station at a lower cost than it can be obtained from an outside authority. It is proposed to invite tenders for the supply of new boiler units, turbo-alternators, pipework, etc. The ultimate objective for the station is a working capacity of 80,000 kw. with a reserve capacity of 20,000 kw. It is now proposed to provide for a working capacity of 67,000 kw. with a reserve of 20,000kw. The estimated cost of this part of the scheme is £450,000. A set-off against this expenditure, estimated to be at least £25,000 a year on the present loading, will probably be effected owing to the reduction in fuel consumption which may be anticipated from the new plant. The proposals will satisfy the requirements until 1938.

## MISCELLANEOUS NEWS AND NOTES.

**Traffic Control at Ludgate-circus.**—Beginning to-day (Saturday), at 8 a.m., traffic at Ludgate-circus will be controlled by a system of light signals, regulated by a police officer in a kiosk on the Farringdon-street island.

**Headlight Regulations.**—The Minister of Transport announced in the House of Commons on Wednesday that he hoped to make provisional regulations at an early date for dealing with dazzling headlights on motor vehicles.

**Effect of Free Rides at Hull.**—The report of the committee investigating the causes of the low surpluses of the Hull tramways shows that free rides given to old-age pensioners, blind persons and others last year reduced the revenue by £36,000.

**More Omnibuses for Glasgow.**—Glasgow Corporation has invited tenders for 50, and alternatively 100 double-deck omnibuses. It is expected that 20 omnibuses now under construction will be completed next month. Glasgow owns 239 omnibuses of the double-deck type.

**Lancashire United Transport & Power Co., Ltd.,** has informed Hindley District Council that subject to the approval of the Ministry of Transport it is the company's intention to cease running tramcars on the Atherton to Ashton-in-Makerfield route and to substitute trolleybuses.

**Crude Oil Engines.**—Public demonstrations of the heavy oil motor engine invented by M. Hesselman, which was described in "The Times" of July 9, were given by the inventor in Stockholm on Thursday. Engines fitted to an omnibus and a lorry are reported to have worked successfully.

**Threat of an Injunction at York.**—At a meeting of York Corporation on July 7, Alderman W. Dobbie (chairman of the Transport Committee) announced that the Committee had withdrawn a proposal to run the omnibuses with private parties to places outside the city, owing to a threat of an application for an injunction.

**Broken Glass in Tramcar and Omnibus Collision.**—Early on the morning of July 9 a Glasgow-Bournemouth omnibus collided with a tramcar at the corner of West Nile and Renfrew-street, Glasgow, and much glass was broken. The omnibus was only slightly damaged. The passengers in both vehicles had narrow escapes.

**Rival Omnibuses at Middlesbrough.**—Middlesbrough Corporation proposes to take action to stop the blocking of the approach to its transport bridge by omnibuses of competing companies. It is stated that the competition was so keen that the owners of some omnibuses were in the habit of parking them practically across the bridge to prevent rival omnibuses getting away first.

**Bath-Bristol Omnibus Service.**—The Bristol Tramways & Carriage Co., Ltd., have increased their omnibus service between Bath and Bristol, there being a 15-minute service until 1.20 p.m., and then every ten minutes until 11 p.m. On Sundays the omnibuses run every ten minutes from 1.55 p.m. until 10 p.m. The service from Bath to Blagdon and Weston-super-Mare is also increased.

**Southport Considering Transport Changes.**—At the July meeting of Southport Town Council Councillor Billington, chairman of the Tramways Committee, said that the Committee were considering the whole question of transport, and he intended to give a full report of policy with regard to both tramcars and omnibuses. In reply to Councillor Hibbott, who advocated abolition of tramways in Monument-square, London-street, and part of Lord-street, Councillor Billington said they would not be satisfied until they had got the tramcars off Lord-street.

**Irish Omnibus Dispute.**—At a mass meeting of railway workers in Dublin on July 7 a resolution was passed calling for a general strike on the Irish railways unless the Irish Omnibus Co. consent to recognise the National Union of Railwaymen as the representative body for the company's workers. The Irish Omnibus Co. has services in the south and west of Ireland with a fleet of about 220 coaches. The strike of the omnibus men who are members of the National Union of Railwaymen began two months ago, but the company has maintained its services.

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**Trolleybus Overhead Wires.**—In the summary of the remarks made by Mr. N. Clough in the discussion on Mr. Vincent Edwards' paper "Notes on substituting a trolleybus system for a tramway," there was an inaccuracy. When taking exception to the use of a 6/0 negative trolley wire as feeder, Mr. Clough wished to convey that it was advisable for the positive and negative trolley wires to be of a similar gauge.

**Charing Cross Bridge.**—The Minister of Transport has approved of the setting up of an Advisory Committee for the purpose of preparing and submitting to the London County Council, within nine months, an agreed scheme for a road bridge and approaches at Charing Cross. Sir Leslie Scott, K.C., has consented to act as chairman. The L.C.C. representatives will be Sir Percy Simmons and Mr. L. Silkin.

**Wigan's Transport Policy.**—Alderman Santus, chairman of Wigan Tramways Committee, announced at a meeting of the Council that a comprehensive report on the town's transport is being prepared, and when it is completed the Committee hope to present a definite policy for the new transport system. The corporation is negotiating with local authorities in the district to obtain support for proposals to operate trolleybuses.

**Bristol Travel Bureau.**—The Bristol Tramways and Carriage Co., Ltd., have established a road travel bureau at Princes-street, Bristol. In pleasant rooms in the company's newly-erected building passengers can wait for connections and secure refreshments. The ground floor is used as a booking office and waiting-room. On the second floor there is a café with kitchen and service equipment. On the top floor there is a smoking-room.

**A Guide to Glasgow Omnibus Services.**—A new booklet containing the time-table of the Glasgow Corporation Transport service has a foreword by Councillor P. J. Dollan, convener of the Municipal Transport Committee, who says that there are nearly 200 omnibuses in operation and within a few years that number will be at least doubled. The growth of the housing scheme and the spreading out of the population have made transport development inevitable.

**L.N.E. Railway Branch Lines Being Closed.**—Passenger services on old branch lines of the L.N.E.R. in Northumberland are to be discontinued, as well as from twelve stations between York and Scarborough on September 22. Goods trains services will be maintained, but the passenger trains are being stopped because fewer passengers are using them. The Northumberland branches to be closed are those between Hexham and Allendale, twelve miles long and serving four stations, and between Alnwick and Cornhill, thirty-five miles of line with ten stations.

**Motor Coach and Omnibus Collide.**—Twenty passengers were injured as a result of a collision between a Queen's line motor coach, travelling from London to Swansea, and an omnibus of the Bristol Tramways Co., on the service between Gloucester and Cheltenham, at the Gloucester city boundary on June 9. The coach skidded on the greasy road after the driver had applied the brakes on approaching a bend, and the two vehicles crashed head on. Most of the windows in the coach and the omnibus were smashed, and all the passengers with a few exceptions received cuts.

**Road Transport Men.**—At the annual conference of the National Union of Railwaymen at West Hartlepool on Wednesday, a resolution was pased congratulating the Government upon its effort in the Road Traffic Bill to establish a measure of control over road transport as a step towards complete national control of transport. The conference also approved the policy adopted by the Executive Committee to organise all the employees of road services that are partially or wholly owned by railway companies. Satisfaction was expressed that the Road Traffic Bill proposed some regulation of working hours and wages paid to road transport workers. It was reported that the Union had failed to reach an agreement with the Transport and General Workers' Union on the organisation of the men. Mr. W. R. Webster, who proposed the resolution, said they were fighting a gigantic trust. Sooner or later the workers would have to arrange a combination of all transport unions. Mr. E. T. Cozens said the competition of road services was a menace to railway employees unless the conditions were brought up to those of the railway workers. Mr. C. T. Cramp, the secretary, said the position took them back thirty or forty years in the work of organising their own industry. There must be recognition of the Union in all cases.

**Works Committees in the Transport Industry.**—Mr. C. J. Spencer, general manager of the Metropolitan Electric Tramways, Ltd., and other tramways of the Underground group, gave evidence at a meeting of the Royal Commission on Labour in India, on July 10, at India House, Aldwych, when Mr. J. H. Whitley presided. Mr. Spencer said that the system of works committees in the tramway industry was a great benefit. It had created trust on both sides, and enabled each to appreciate the difficulties of the other. In reply to questions of the chairman, Mr. Spencer added that it was of considerable value to a tramways company to keep in close touch with those concerned with operation. Many minor things were brought forward which the management might not have appreciated to be of common interest. The Chairman: This machinery is affording the workers an opportunity of feeling that they are, in the real sense, partners in the prosperity of an industry? Mr. Spencer agreed. Replying to Sir Alexander Murray, Mr. Spencer said that if the workpeople were not organised, nothing could be done; he did not mean necessarily organised in connection with a trade union. Sir Victor Sassoon: There is no reason why employers should not organise machinery to enable their workmen to send representatives to a works committee. That would be all the organisation necessary? Mr. Spencer agreed.

**Injunction Against Newcastle Corporation.**—The United Automobile Services, Ltd., has secured an injunction against Newcastle Corporation restraining it from employing omnibuses on runs outside the city, for which the Corporation did not hold standard passenger licences. Hitherto the Corporation has used spare omnibuses occasionally to carry visiting convention delegates to points of interest. The United Co., however, objected to what they regarded as unfair competition, and were successful in securing an injunction. It is understood that the Newcastle Transport Committee are taking counsel's opinion with regard to further steps.

**Institute of Transport Congress.**—The annual congress of the Institute of Transport was held in Glasgow this week, under the chairmanship of Sir Josiah Stamp, president. The proceedings opened on Tuesday, when the Lord Provost welcomed the delegates, and Sir Josiah Stamp, in reply, spoke of the aims of the Institute. Mr. E. J. H. Lemon, carriage and wagon superintendent of the L.M.S. Rly., read a paper on railway amalgamation and its effect on the workshops. In the afternoon delegates visited the shipyard of John Brown & Co., Ltd., and the locomotive and carriage works of the L.M.S. Railway. On Wednesday Sir George Buchanan, K.C.I.E., read a paper on port development and administration, and in the afternoon parties of delegates visited various works, including those of the Albion Motor Car Co., Ltd., and the test line of the George Bennie railplane system of transport.

## FINANCIAL.

**National Omnibus.**—The directors of the National Omnibus and Transport Co., have called meetings for July 28 to consider a scheme for the reduction of capital. It is proposed to reduce the capital from £1,000,000 to £450,000 by returning 10s. per share of each of the 500,000 £1 preference shares and 12s. per share of each of the 500,000 £1 ordinary shares.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended July 9 amounted to £83,585, an increase of £238 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to July 9 (14 2-7 weeks), the total receipts were £1,194,778, a decrease of £2,125.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended June 21 give total receipts of £422,893, or £7,131 more than in the corresponding week of last year. The aggregate receipts for twelve weeks amounted to £5,057,545, an increase of £115,050 over the corresponding period of last year.

**Chester's Changeover from Tramways.**—The annual statement of Chester Corporation Transport Department for the year ended March 31 last, issued by Mr. W. H. Ellis, the general manager, shows that tramway operation ceased on February 15, and arrangements for the motor omnibuses were so far advanced that running was started three days before the appointed date. The working of the two systems resulted in a net profit of £1,924. On the tramways the total revenue was £20,034, the expenses being £13,808, inclusive of £2,124 for power expenses at 1.1515d. per unit. The mileage traversed was 310,634, the passengers numbering 3,642,970. The average number of cars in use was nine. Percentage of working expenses to receipts came out at 70.5. Average traffic revenue per mile was 15.47d., the average working expenses per car mile was 10.67d. The average fare charged per mile was .94d., the average number of passengers per car mile being 11.7. On the omnibus side the revenue was £3,749, the expenses totalling £3,462. The mileage was 71,400, and the passengers totalled 714,041. Of a gross capital expenditure of £111,820, the amount owing is £62,935. There is a reserve fund of £7,907.

## CONTRACTS.

**The English Electric Co., Ltd.,** has a contract to supply forty top-covered motor omnibus bodies to Birmingham Corporation Tramways Department.

**John I. Thornycroft & Co., Ltd.,** have just received a repeat order from Southampton Corporation for three double-deck omnibuses, type "B.C.Forward" chassis.

**Swansea Health Committee** has accepted the tender of Karrier Motors, Ltd., for the supply of a motor sweeping machine with tank capacity of 350 gallons.

**Siemens Electric Lamps and Supplies, Ltd.,** have received a further contract from the Royal Mail Steam Packet Co. for a twelve months' supply of Siemens electric lamps.

**Bradford Tramways Committee** has accepted the tender of the Central Heating Co., Ltd., of Leeds, at £1,614, for the installation of heating apparatus at the central omnibus garage.

**Guy Motors, Ltd.,** who for a number of years have supplied four and six-wheel omnibuses to Northampton Corporation, have at present on hand an order for an additional six six-wheel double-deck vehicles. They have just delivered three six-cylinder single-deck "Conquest" models.

**Airvac Ventilators,** of Honeypot Works, Darlington, have received a sixth repeat order for 108 Airvac ventilators, type R, from the Bombay, Baroda and Central India Railway. During the past month orders have been received from the Iraq Railways for 60 Airvac ventilators and 40 interior fittings, 28 type RM airvacs for locomotive cab roofs for the Benguela Railway, and type R airvacs for the North Western Railway of India, Sudan Government Railways, and the Entre Rios Railway, in the latter case for equipping an articulated steam rail car.

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## PERSONAL.

**Mr. D. Johnstone Sinclair** has joined the boards of the International Automatic Telephone and the Automatic Telephone Manufacturing Companies.

**Mr. C. R. Bellamy,** general manager of the Hong Kong Tramways, Ltd., is in this country on short leave. He expects to return to Hong Kong in November.

**Sir Hugh Turnbull,** Commissioner of the City of London Police, proposes to pay a seven-weeks' visit to America in the autumn. He will attend a traffic conference at Washington and will also examine the traffic methods of the principal police forces in the United States.

**Mr. Thomas Peirson Frank, M.Inst.C.E., F.S.I.,** was appointed, at the meeting of the London County Council on Tuesday, chief engineer and county surveyor at a salary of £3,000 per annum, as from December 1 next, in succession to Sir George Humphreys. Mr. W. H. Webbe, vice-chairman of the General Purposes Committee, in presenting the recommendation, said that at no time had the Council been faced with so many engineering problems as was likely to be the case within the next few years. Mr. Frank had discharged heavy responsibilities in many cities, including Plymouth, Cardiff and Liverpool.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | July 1 | 548 | 534 | — 14 | 13 | 7,533 | — 192 |
| „ Motor Buses ... | „ 1 | 217 | 293 | + 76 | 13 | 3,768 | + 466 |
| „ Total ... ... | „ 1 | 765 | 827 | + 62 | 13 | 11,301 | + 274 |
| Aberdeen Corp. ... | „ 2 | 5,461 | 5,244 | — 217 | 4½ | 24,575 | + 1,039 |
| Ashton-u-Lyne Corp. | June 28 | 924 | 834 | — 90 | 13 | 11,133 | — 4,767 |
| „ Motor Buses ... | „ 28 | 498 | 483 | — 15 | 13 | 6,519 | + 37 |
| „ Trolley Buses ... | „ 28 | 283 | 243 | — 40 | 13 | 3,470 | — 216 |
| „ Total ... ... | „ 28 | 1,705 | 1,560 | — 145 | 13 | 21,122 | — 4,946 |
| Ayr Corporation ... | July 5 | 679 | 614 | — 65 | 7 | 4,070 | — 259 |
| Barrow Corporation... | June 30 | 633 | 591 | — 42 | 15 | 7,473 | — 480 |
| „ Motor Buses ... | „ 30 | 374 | 417 | + 43 | 15 | 5,055 | + 1,012 |
| „ Total ... ... | „ 30 | 1,007 | 1,008 | + 1 | 15 | 12,528 | + 532 |
| Belfast City ... ... | July 4 | 11,203 | 11,707 | + 504 | 13½ | 158,917 | + 7,086 |
| „ Motor Buses ... | „ 4 | 1,006 | 1,327 | + 321 | 13½ | 18,593 | + 3,954 |
| „ Total ... ... | „ 4 | 12,209 | 13,034 | + 825 | 13½ | 177,510 | + 11,040 |
| Birkenhead Corp. ... | „ 6 | 1,736 | 1,638 | — 98 | 14 | 22,169 | — 1,442 |
| „ Motor Buses ... | „ 6 | 3,579 | 3,963 | + 384 | 14 | 49,760 | + 3,945 |
| „ Total ... ... | „ 6 | 5,315 | 5,601 | + 286 | 14 | 71,929 | + 2,503 |
| Birmingham Corp. ... | „ 1 | 27,526 | 26,905 | — 621 | 13 | 352,225 | — 3,592 |
| „ Motor Buses ... | „ 1 | 13,373 | 15,719 | + 2,346 | 13 | 202,535 | + 37,460 |
| „ Trolley Buses ... | „ 1 | 560 | 548 | — 12 | 13 | 7,323 | + 159 |
| „ Total ... ... | „ 1 | 41,459 | 43,172 | + 1,712 | 13 | 562,083 | + 34,027 |
| Blackburn Corp. ... | „ 2 | 2,066 | 1,917 | — 149 | 13½ | 24,914 | — 1,425 |
| „ Motor Buses ... | „ 2 | Nil | 308 | + 308 | 13½ | 4,305 | + 4,305 |
| „ Total ... ... | „ 2 | 2,066 | 2,225 | + 159 | 13½ | 29,219 | + 2,880 |
| Bradford Corporation | „ 5 | 15,277 | 15,613 | + 336 | 14 | 198,626 | — 9,554 |
| Brighton Corporation | „ 6 | 2,761 | 3,148 | + 387 | 13½ | 36,660 | + 2,205 |
| Burnley Corporation... | „ 5 | 2,859 | 3,058 | + 199 | ... | ... | ... |
| „ Motor Buses ... | „ 5 | 655 | 713 | + 58 | ... | ... | ... |
| „ Total ... ... | „ 5 | 3,514 | 3,771 | + 257 | ... | ... | ... |
| Burton-on-Trent Corp. | „ 6 | 797 | 835 | + 38 | 14 | 11,838 | + 823 |
| Bury Corporation ... | „ 6 | 1,966 | 1,828 | — 138 | 13½ | 25,700 | — 3,648 |
| „ Motor Buses ... | „ 6 | 440 | 1,154 | + 714 | 13½ | 15,189 | + 9,699 |
| „ Total ... ... | „ 6 | 2,406 | 2,982 | + 576 | 13½ | 40,889 | + 6,051 |
| Cardiff Corporation ... | „ 5 | 7,801 | 7,892 | + 91 | 13½ | 107,708 | + 2,822 |
| Chatham and District | „ 3 | 1,208 | 1,359 | — 151 | 26 | 29,114 | + 1,373 |
| Chester Corporation ... | „ 6 | 450 | Nil | — 450 | 14 | Nil | — 6,274 |
| „ Motor Buses ... | „ 6 | Nil | 683 | + 683 | 14 | 9,092 | + 9,092 |
| „ Total ... ... | „ 6 | 450 | 683 | + 233 | 14 | 9,092 | + 2,818 |
| Chesterfield Corp. ... | „ 7 | 1,842 | 1,892 | + 50 | 14 | 26,072 | + 1,057 |
| Colchester Corp. ... | „ 2 | 559 | 653 | + 94 | 14 | 8,039 | + 885 |
| Colne Corporation ... | „ 2 | 726 | 697 | — 29 | 13 | 9,539 | + 67 |
| Coventry Corporation | „ 6 | 2,126 | 1,955 | — 171 | 14 | 28,692 | — 1,629 |
| „ Motor Buses ... | „ 6 | 1,580 | 1,752 | + 172 | 14 | 25,650 | + 3,578 |
| „ Total ... ... | „ 6 | 3,706 | 3,707 | + 1 | 14 | 54,342 | + 1,949 |
| Darlington Corp. ... | „ 5 | 1,002 | 1,288 | + 286 | 13½ | 14,716 | + 1,393 |
| Derby Corporation ... | „ 5 | 2,502 | 2,527 | + 25 | 14 | 34,153 | — 411 |
| „ Motor Buses ... | „ 5 | 751 | 924 | + 173 | 14 | 12,691 | + 3,355 |
| „ Total ... ... | „ 5 | 3,253 | 3,451 | + 198 | 14 | 46,844 | + 2,944 |
| Dover Corporation ... | „ 5 | 419 | 476 | + 57 | 14 | 5,495 | + 241 |
| Dundee Corporation... | June 10 | 2,624 | 2,736 | + 112 | 3½ | 9,775 | — 610 |
| „ Motor Buses ... | „ 10 | 895 | 1,010 | + 115 | 3½ | 3,495 | + 279 |
| „ Total ... ... | „ 10 | 3,519 | 3,746 | + 227 | 3½ | 13,268 | — 331 |
| East Ham Corp. ... | July 5 | 2,306 | 2,379 | + 73 | 13½ | 32,002 | + 768 |
| Edinburgh Corp. ... | June 28 | 15,159 | 15,186 | + 27 | 6½ | 97,983 | + 1,451 |
| „ Motor Buses ... | „ 28 | 3,637 | 4,020 | + 383 | 6½ | 25,422 | + 2,350 |
| „ Total ... ... | „ 28 | 18,796 | 19,206 | + 410 | 6½ | 123,405 | + 3,801 |
| Exeter Corporation ... | July 9 | 911 | 909 | — 2 | 15 | 12,040 | — 516 |
| Glasgow Corporation... | June 28 | 46,055 | 45,219 | — 836 | 4 | 183,870 | + 3,175 |
| „ Motor Buses ... | „ 28 | 5,355 | 8,696 | + 3,341 | 4 | 34,758 | + 13,500 |
| „ Total ... ... | „ 28 | 51,410 | 53,915 | + 2,505 | 4 | 218,628 | + 16,675 |
| Gloucester Corp. ... | July 2 | 549 | 723 | + 174 | 13½ | 9,341 | + 2,107 |
| Grimsby Corporation | „ 5 | 1,388 | 1,718 | + 330 | 14 | 21,160 | — 2,730 |
| Halifax Corporation | „ 1 | 4,469 | 5,286 | + 817 | 13½ | 68,681 | + 8,122 |
| Huddersfield Corp. ... | „ 5 | 6,277 | 6,625 | + 348 | 14 | 89,294 | — 1,270 |
| Hull Corporation ... | „ 5 | 5,756 | 5,760 | + 4 | 14 | 80,247 | — 635 |
| „ Motor Buses ... | „ 5 | 1,336 | 1,625 | + 289 | 14 | 20,089 | + 1,940 |
| „ Total ... ... | „ 5 | 7,092 | 7,385 | + 293 | 14 | 100,336 | + 1,305 |
| Ilford Corporation ... | „ 5 | 1,499 | 1,609 | + 110 | 13½ | 21,169 | + 434 |
| Ipswich Corp. Trol.Bus | „ 5 | 1,363 | 1,392 | + 29 | 13½ | 18,327 | + 1,155 |
| Isle of Thanet ... | „ 2 | 1,289 | 1,273 | — 16 | 26½ | 14,280 | — 491 |
| Kilmarnock Corp. ... | „ 5 | 461 | 489 | + 28 | 7½ | 3,635 | + 155 |
| Lancashire Un. ... | June 29 | 2,271 | 2,140 | — 131 | 25½ | 55,783 | — 2,572 |
| „ Motor Buses ... | „ 29 | 4,574 | 4,859 | + 285 | 25½ | 122,870 | + 18,201 |
| Leeds Corporation ... | July 5 | 19,607 | 21,399 | + 1,792 | 13½ | 278,916 | + 9,020 |
| Leicester Corp. ... | „ 5 | 8,587 | 8,617 | + 30 | 14 | 116,720 | + 1,812 |
| Lincoln Corp. ... | June 29 | 909 | 895 | — 14 | 13 | 11,958 | + 52 |
| Liverpool Corp. ... | July 5 | 30,667 | 31,595 | + 928 | 13½ | 417,593 | + 5,963 |
| London County Coun. | „ 9 | 83,347 | 83,585 | + 238 | 14½ | 1,194,778 | — 2,125 |
| Luton Corporation ... | „ 2 | 402 | 445 | + 43 | 13½ | 5,501 | + 317 |
| Maidstone Corp. ... | „ 3 | 290 | Nil | — 290 | 13½ | Nil | — 3,383 |
| „ Motor Buses ... | „ 3 | 281 | 303 | + 22 | 13½ | 3,770 | + 24 |
| „ Trolley Buses ... | „ 3 | 380 | 744 | + 364 | 13½ | 8,524 | + 4,332 |
| „ Total ... ... | „ 3 | 951 | 1,047 | + 96 | 13½ | 12,294 | + 973 |
| Manchester Corp. ... | „ 5 | 36,166 | 33,819 | — 2,347 | 14 | 447,353 | — 39,371 |
| „ Motor Buses ... | „ 5 | 5,314 | 9,257 | + 3,943 | 14 | 119,030 | + 50,020 |
| „ Total ... ... | „ 5 | 41,480 | 43,076 | + 1,596 | 14 | 566,383 | + 10,649 |
| Middlesbrough Corp. | „ 1 | 1,095 | 1,076 | — 19 | 13½ | 13,987 | — 850 |
| „ Motor Buses ... | „ 1 | 529 | 625 | + 96 | 13½ | 7,498 | + 844 |
| „ Total ... ... | „ 1 | 1,524 | 1,601 | + 77 | 13½ | 21,485 | — 6 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty.Corp. | July 5 | 9,932 | 8,524 | — 1,408 | 13½ | 122,578 | — 15,428 |
| „ Motor Buses ... | „ 5 | 1,815 | 3,209 | + 1,394 | 13½ | 39,348 | + 11,161 |
| „ Total ... ... | „ 5 | 11,747 | 11,733 | — 14 | 13½ | 161,926 | — 4,267 |
| Newport Corporation | June 28 | 1,678 | 1,550 | — 128 | 13 | 20,607 | — 573 |
| „ Motor Buses ... | „ 28 | 766 | 773 | + 7 | 13 | 10,525 | + 941 |
| „ Total ... ... | „ 28 | 2,444 | 2,323 | — 121 | 13 | 31,222 | + 368 |
| Northampton Corp. ... | July 4 | 1,046 | 1,061 | + 15 | 13½ | 15,059 | — 326 |
| „ Motor Buses ... | „ 4 | 682 | 712 | + 30 | 13½ | 9,952 | + 1,295 |
| „ Total ... ... | „ 4 | 1,728 | 1,773 | + 45 | 13½ | 25,011 | + 969 |
| Nottingham Corp. ... | „ 3 | 6,565 | 5,845 | — 720 | 13½ | 78,436 | — 10,574 |
| „ Motor Buses ... | „ 3 | 2,253 | 3,474 | + 1,221 | 13½ | 44,481 | + 14,100 |
| „ Trolley Buses ... | „ 3 | 598 | 1,217 | + 619 | 13½ | 16,261 | + 8,226 |
| „ Total ... ... | „ 3 | 9,416 | 10,536 | + 1,120 | 13½ | 139,178 | + 11,752 |
| Oldham Corporation | „ 5 | 3,560 | 3,383 | — 177 | 15 | 50,232 | — 3,531 |
| „ Motor Buses ... | „ 5 | 2,072 | 2,050 | — 22 | 15 | 30,146 | — 229 |
| „ Total ... ... | „ 5 | 5,632 | 5,433 | — 199 | 15 | 80,378 | — 3,760 |
| Plymouth Corp. ... | „ 5 | 3,784 | 3,747 | — 37 | 13½ | 49,956 | — 705 |
| „ Motor Buses ... | „ 5 | 2,006 | 2,514 | + 508 | 13½ | 32,833 | + 7,049 |
| „ Total ... ... | „ 5 | 5,790 | 6,261 | + 471 | 13½ | 82,789 | + 6,344 |
| Portsmouth Corp. ... | „ 5 | 6,694 | 8,539 | + 1,845 | 14 | 98,633 | + 14,376 |
| Preston Corporation... | „ 2 | 1,777 | 1,661 | — 116 | 13½ | 22,190 | — 1,018 |
| „ Motor Buses ... | „ 2 | 478 | 511 | + 33 | 13½ | 6,849 | + 452 |
| „ Total ... ... | „ 2 | 2,255 | 2,172 | — 83 | 13½ | 29,039 | — 566 |
| Rawtenstall Corp. ... | „ 6 | 872 | 642 | — 230 | 13½ | 9,372 | — 2,692 |
| „ Motor Buses ... | „ 6 | 540 | 690 | + 150 | 13½ | 9,759 | + 2,321 |
| „ Total ... ... | „ 6 | 1,412 | 1,332 | — 80 | 13½ | 19,131 | — 371 |
| Reading Corporation | „ 3 | 1,517 | 1,496 | — 21 | 14 | 19,523 | — 630 |
| „ Motor Buses ... | „ 3 | 929 | 1,035 | + 106 | 14 | 13,878 | + 1,731 |
| „ Total ... ... | „ 3 | 2,446 | 2,531 | — 85 | 14 | 33,401 | + 1,101 |
| Rochdale Corp. ... | „ 5 | 3,040 | 2,843 | — 197 | ... | 38,505 | — 3,345 |
| „ Motor Buses ... | „ 5 | 1,598 | 1,557 | — 41 | ... | 21,942 | + 764 |
| „ Total ... ... | „ 5 | 4,638 | 4,400 | — 238 | ... | 60,447 | — 2,581 |
| Rotherham Corp. ... | „ 7 | 2,600 | 2,673 | + 73 | 14 | 38,954 | + 2,010 |
| Salford Corporation ... | „ 6 | 11,289 | 11,917 | + 619 | 13½ | 158,559 | + 3,372 |
| Sheffield Corp. ... | „ 5 | 21,029 | 20,914 | — 115 | 13½ | 290,387 | — 1,173 |
| Southampton Corp. ... | „ 2 | 3,389 | 3,935 | + 546 | 14 | 45,918 | + 1,116 |
| „ Motor Buses ... | „ 2 | 788 | 963 | + 175 | 14 | 11,791 | + 2,095 |
| „ Total ... ... | „ 2 | 4,177 | 4,898 | + 721 | 14 | 57,709 | + 3,211 |
| Southend-on-Sea Corp. | „ 9 | 2,496 | 2,559 | + 63 | 14½ | 30,015 | — 760 |
| „ Motor Buses ... | „ 9 | 180 | 397 | + 217 | 14½ | 4,125 | + 1,962 |
| „ Total ... ... | „ 9 | 2,676 | 2,956 | + 280 | 14½ | 34,140 | + 1,202 |
| Southport Corp. ... | „ 5 | 1,485 | 1,469 | — 16 | 13½ | 18,141 | — 66 |
| „ Motor Buses ... | „ 5 | 430 | 491 | + 61 | 13½ | 5,767 | + 677 |
| „ Total ... ... | „ 5 | 1,915 | 1,960 | + 45 | 13½ | 23,908 | + 611 |
| St. Helens Corp. ... | „ 1 | 1,979 | 2,021 | + 42 | 13½ | 26,803 | + 1,958 |
| Sunderland Corp. ... | „ 8 | 2,382 | 2,817 | + 435 | 14 | 35,441 | + 1,909 |
| „ Motor Buses ... | „ 8 | 377 | 628 | + 251 | 14 | 7,133 | + 5,233 |
| „ Total ... ... | „ 8 | 2,759 | 3,445 | + 686 | 14 | 42,574 | + 7,142 |
| Swindon Corp. ... | „ 3 | 604 | 1,009 | + 405 | 13½ | 13,191 | + 3,587 |
| Wallasey Corp. ... | „ 5 | 1,420 | 1,403 | — 17 | 13½ | 17,372 | — 1,065 |
| „ Motor Buses ... | „ 5 | 2,247 | 2,742 | + 495 | 13½ | 32,002 | + 4,024 |
| „ Total ... ... | „ 5 | 3,667 | 4,145 | + 478 | 13½ | 49,374 | + 2,959 |
| Walsall Corporation... | June 29 | 3,198 | 3,305 | + 107 | 13 | 45,766 | + 1,755 |
| Walthamstow Corp. ... | July 5 | 2,448 | 2,613 | + 165 | 13½ | 34,522 | + 280 |
| Warrington Corp. ... | „ 3 | 873 | 941 | + 68 | 14 | 12,464 | + 43 |
| „ Motor Buses ... | „ 3 | 453 | 640 | — 187 | 14 | 7,059 | + 851 |
| „ Total ... ... | „ 3 | 1,326 | 1,581 | — 255 | 14 | 19,523 | + 894 |
| West Ham Corp. ... | „ 3 | 5,905 | 6,090 | + 185 | 13½ | 83,273 | + 2,436 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | June 29 | 2,720 | 2,344 | — 376 | 13 | 31,850 | — 4,874 |
| „ Trolley Buses ... | „ 29 | 3,342 | 3,426 | + 84 | 13 | 46,246 | + 3,329 |
| „ Total ... ... | „ 29 | 6,062 | 5,770 | — 292 | 13 | 78,096 | — 1,545 |
| York Corporation ... | July 2 | 994 | 1,029 | + 35 | 14 | 14,090 | + 585 |
| „ Motor Buses ... | „ 2 | 343 | 487 | + 144 | 14 | 6,792 | + 1,919 |
| „ Trolley Buses ... | „ 2 | 58 | Nil | — 58 | 14 | Nil | — 661 |
| „ Total ... ... | „ 2 | 1,395 | 1,516 | + 121 | 14 | 20,882 | + 1,843 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or *M* | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | July 1 | £82,235 | £79,089 | 26 *w* | £2,187,639 | — £85,818 |
| Brazilian Traction $ | May. | 4,206,895 | 4,304,160 | 5 *m* | 20,139,475 | + 313,343 |
| British Columbia $ | May | 1,165,279 | 1,203,292 | 11 *m* | 13,514,147 | + 599,302 |
| Buenos Aires Lacroze | July 6 | 11,825 | 10,011 | 1 *w* | 10,011 | — 1,814 |
| Burma E. Sup. Co. Rs. | May | 66,077 | 66,320 | 10 *m* | 643,528 | — 22,026 |
| Calcutta ... Rs. | July 5 | 124,910 | 102,010 | 26½ *w* | 3,028,178 | — 374,664 |
| Cape Town ... ... | May | 29,366 | 27,286 | ... | ... | ... |
| Carthagena & Herrerias | June | 1,476 | 515 | 6 *m* | 5,612 | — 209 |
| Durban ... ... | May | 24,518 | 23,945 | 10 *m* | 238,483 | — 714 |
| East India ... ... | June | 3,772 | 3,803 | 11 *m* | 41,627 | + 438 |
| Kalgoorlie ... ... | Mar. | 1,682 | 1,710 | 3 *m* | 4,601 | — 45 |
| Madras (2 weeks) Rs. | June 30 | 42,660 | 42,076 | 24 *w* | 548,531 | + 28,473 |
| Para ... ... | May | 15,182 | 15,568 | 6 *m* | 88,779 | + 1,171 |
| Port Elizabeth ... | May | 7,601 | 7,552 | ... | ... | ... |
| Rangoon ... Rs. | June | 114,535 | 142,170 | 6 *m* | 899,635 | + 190,824 |
| Shanghai ... $ | June | 335,740 | 367,231 | 6 *m* | 1,923,292 | — 42,708 |
| Singapore ... ...$ | June | 123,000 | 140,000 | 9 *m* | 1,223,000 | + 140,000 |
| Winnipeg ... ...$ | May | 534,954 | 509,709 | 5 *m* | 2,793,546 | — 28,794 |

## RAILWAY RECEIPTS.

| 27th Week ended July 6th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 280,000 | — 12,000 | 315,000 | — 26,000 | 595,000 | — 38,000 | — 570,000 |
| L.M.S.R. | 619,000 | — 17,000 | 717,000 | — 102,000 | 1,336,000 | — 119,000 | —1,747,000 |
| L.N.E.R. | 418,000 | — 13,000 | 574,000 | — 61,000 | 992,000 | — 74,000 | — 903,000 |
| S.R. | 380,000 | + 5,000 | 98,000 | + 8,000 | 478,000 | + 13,000 | — 123,000 |
| Totals | 1,697,000 | — 37,000 | 1,704,000 | — 181,000 | 3,401,000 | — 218,000 | —3,343,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| LONDON UNDERGROUND | | | | | | |
| Common Fund Cos. | July 5 | 298,400 | 331,500 | + 33,100 | 8,139,400 | + 560,800 |
| Lond. & Sub. Group | „ 5 | 43,600 | 49,100 | + 5,500 | 1,185,900 | + 96,400 |
| METROPOLITAN RAILWAY | „ 5 | 37,400 | 37,200 | — 200 | 993,500 | + 24,800 |
| LIVERPOOL OVERHEAD | „ 6 | 1,814 | 1,730 | — 84 | 41,238 | — 2,362 |
| MERSEY RAILWAY ... | „ 5 | 4,491 | 4,552 | + 61 | 124,461 | + 4,070 |

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THE Tramway & Railway World
WITH OMNIBUS & COACH SECTION

Founded 1892 LONDON, JULY 17, 1930 VOL. LXVIII

# TRANSPORTATION IN TORONTO AND DISTRICT

A MUNICIPAL UNDERTAKING MANAGED BY A COMMISSION.

Members of the American Institute of Electrical Engineers attending their summer convention in Toronto during the last week of June, availed themselves of a daily opportunity of inspecting the undertaking of the Toronto Transportation Commission, which furnishes electric railway, motor omnibus, motor coach and ferry transportation service in the city and its environs. Toronto is the only Canadian city that possesses a municipally-owned and operated tramway system, and its transport provides an excellent service at cost, but without expense to the taxpayers.

This enterprise is managed by a Commission of three citizens appointed by the City Council to serve for three years. The Commission is given full charge of all local transportation facilities, with the proviso that a sufficient fare must be charged to make the services completely self-sustaining. The Commission was organised in 1920 for the purpose of taking over the privately owned Toronto Railway Company on the expiration of its concession on September 1, 1921, together with the Toronto Civic Railway lines which had been constructed by the city to provide for areas unserved by the Toronto Railway.

The cost of acquiring the system of the company in 1921 was about 12,000,000 dollars. Since that time millions of dollars have been spent in complete rehabilitation and extension of the undertaking, until at the present time the fixed assets amount to approximately 50,000,000 dollars. That the enterprise is successful is attested by the fact that since 1921 the Commission has given a service second to none, and the revenue has covered all operating expenses and capital charges on the money invested, set up adequate reserves and still left a surplus of 100,000 dollars a year. Furthermore, the average fare of 6.813 cents compares favourably with that of 7.96 cents for other cities of over 50,000 population, exclusive of New York.

Corner of Yonge and Queen Streets, Toronto.

230 MILES OF TRACK AND NEARLY 1,000 CARS.

The Commission took over 165 miles of single track, including the Toronto Railway, the Suburban Railway

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and the Toronto and York Radial Railway, in order to extend the Commission's lines to the city limits. Of the track taken over from the Toronto Railway, approximately half was completely rebuilt immediately, and the other half partly rebuilt. To this have been added extensions, until now there are 230 miles of single track within the city. There are also 14 miles of single track providing a suburban car service to the

A Busy Street Scene in Toronto.

municipalities along the Lake Shore road to the west and almost 11 miles providing similar service to the east of the city.

The Commission also operates a car service in the township of York and the town of Weston under contracts by which it agrees to lease and operate the cars and the municipalities guarantee the Commission against any deficits. This operation includes about 15 miles of single track. Including the foregoing the Commission operates nearly 270 miles of single track.

Out of 830 cars taken over from the Toronto Railway all but 348 were scrapped as obsolete, and those that were retained were remodelled and modernized, with about 150 being designed and equipped for one-man operation. In addition the Commission purchased 350 steel cars and 225 large steel trailers, and they now have 991 cars of modern design and equipment. Of the five car houses taken over from the Toronto Railway Company, four have been enlarged or rebuilt. One new car house has been built, giving the Commission at the present time, seven modern, well-equipped car depots, located at strategic points for efficient operation.

### Up-to-date Car Shops and Improved Travel.

The shops acquired from the Toronto Railway system were totally inadequate, and were therefore abandoned. New fireproof shops (Hillcrest shops) were built near the geographical centre of the city, and thoroughly equipped to handle maintenance of the cars. These shops represent an investment of 2,000,000 dollars, and the net savings in maintenance costs due to improved methods and machinery amounts to approximately 350,000,000 dollars per year.

Within about six years, therefore, the savings will have returned the whole capital cost involved in the construction. Additional large savings were made in the cost of insurance of these and other buildings by reason of the thoroughly up-to-date and fireproof standards of construction. Due to these improvements the Commission secures over four-and-one-half times as much protection per dollar of insurance premium paid.

Extensive advances have been made in the transportation services. In 1921 there were nine separate and distinct systems or services operating within the city limits, charging as many fares ; the Commission now has one system and one fare. Formerly as many as three different systems had to be used in making a journey within the city, paying as high as 15 cents in fares. Now the transfer privileges to any other route enable one to travel between any two points within the city for a single fare. Where formerly only 17 square miles of territory were served by the one-fare city system, the Commission now serves 34 square miles by its one-fare city system. Services have been extended into districts formerly unserved, and at the present time there is no section of the city which is not within reasonable distance of transportation services. During the

Front Street, Toronto.

maximum rush hour, the number of seats provided has been increased 75 per cent. Schedule speed has been increased about 10 per cent.

### High Safety Record—The Power Supply.

The number of equipment failures in service in relation to the car miles operated has been reduced 75 per cent. The boast of the Commission that the safest place on Toronto's streets is in the street cars, is backed up by the fact that over two and one-quarter billion passengers have been carried since the inception of the Commission, without a fatal accident to a passenger.

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Formerly all cars had to cross over at the end of their routes, but this has been eliminated by the construction of loops on private property. This not only speeds up the operation, but is much safer, and eliminates a great deal of congestion, not only of street cars, but of other street traffic.

Another important operating improvement is the installation of about 90 electric switches at important intersections, thus doing away with the necessity of motormen using switch irons, and materially speeding up the service with a resulting saving in operating costs.

Through improved methods of inspection and maintenance, the number of trolley wire breaks has been reduced from 280 in 1921 to 28 in 1928. In the first five months of 1930 there have been only five breaks.

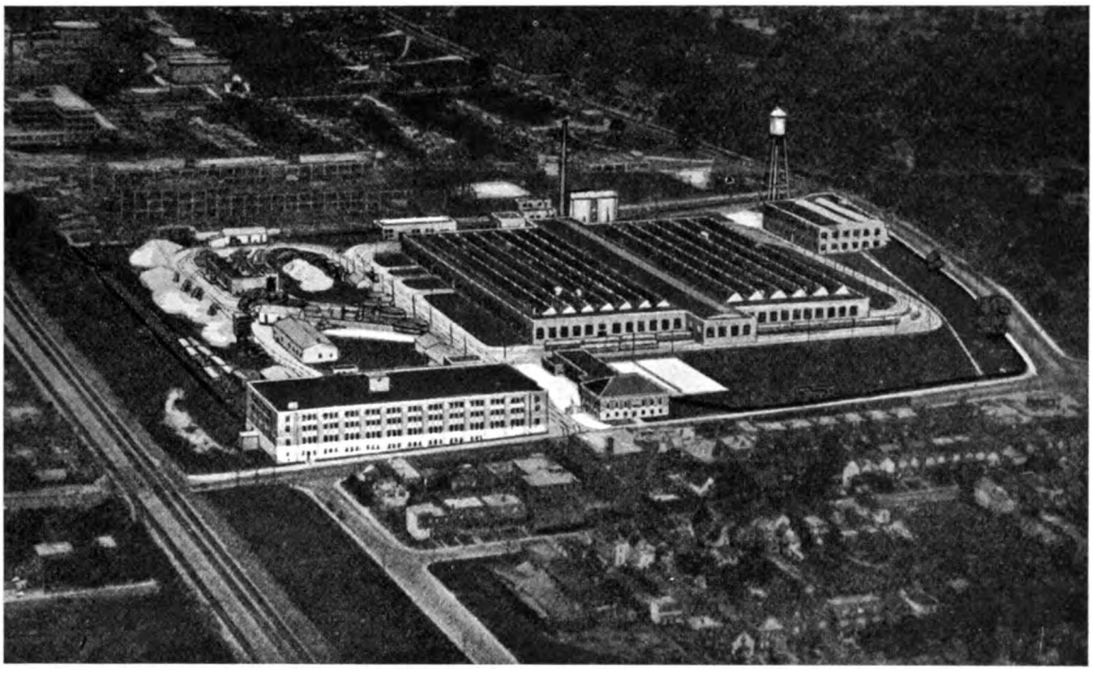
Electric power is delivered to Toronto by the Hydro-electric Power Commission of Ontario, at 110,000 volts, 3-phase, 25 cycle. This is transformed to 13,200 volts and converted to 440 volts, 6-phase, 25 cycle, and finally to 575 volts direct current, which is fed to the trolley wire system. The total peak consumption of the sub-stations supplying the Commission with power is about 50,000 h.p., and the yearly consumption 91,500,000 kw. hr. For distributing this power, nearly 50 miles of underground cable is required, and 220 miles of overhead cable and 270 miles of trolley wire. The latter is of copper-bronze alloy, ⅓ in. thick, having a tensile strength of 55,000 to 70,000 lbs. per sq. in.

Three private telephone systems are maintained by the Electrical Department, comprising 177 telephones located at strategic points. This department also maintains a battery of graphic headway recorders in the executive offices and all divisional car depot offices, which show the time interval between cars on all the principal routes.

### Omnibus and Coach Services.

The Commission started its first omnibus line in September, 1921, and was in this respect one of the first two electric railways in Canada to use the omnibus as an auxiliary. In succeeding years, omnibus operation has been extended, and the Commission now operates eight lines as feeders over about 24 miles of route. The Commission also operates suburban omnibus services in Forest Hill, East York and Leaside, under contracts by which these municipalities guarantee against financial loss. In addition to the omnibus routes operating as feeders to the car lines at the universal fare and with transfer privileges, the Commission also operates two de-luxe coach routes from the Hill and Rosedale residential areas to the shopping district. The fares charged are about double the car line fare, with no transfer privilege to or from the car lines.

Appreciating the field of development of the omnibus and the fact that private operators were developing and expanding omnibus operations from outlying points to the centre of the city, the Commission in 1927 organised a subsidiary company known as Gray Coach Lines, which acquired a number of the more important lines entering the city from outside points. By this means the Commission is assured of the control of the main arteries of travel leading into the city, so that the transportation needs of Greater Toronto can be met and handled efficiently without restricting the influences of competing franchises. Through its subsidiary, Gray Coach Lines, the Commission operates sight-seeing services around the city, and sight-seeing launches through the Island Lagoons. Affiliations have been made with sight-seeing organisations in most of the principal cities in Canada and the United States, and connections established with tourist agencies throughout the world. For the information contained in this article we are indebted to *Electrical News and Engineering*, of Toronto, and for the photographs of Toronto streets to the Canadian Government.



Toronto Transportation Commission's Workshops at Hillcrest, near the Geographical Centre of the City.

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## THE NEW HIGH POWER ELECTRIC LOCOMOTIVES OF THE P.L.M. RAILWAY.

### Results of the Trial Runs

The Oerlikon Company supplied recently to the Paris, Lyons and Mediterranean Railway Co. four express locomotives. These machines with their one hour rating of 5400 h.p., rank as the most powerful single locomotives ever built; they are for operation with direct current at 1500 volts, and are now in use on the Mt. Cenis line.

The locomotives in question have been the object of very special interest on the part of engineers, so much so that the directors of the Midi Railway approached the directors of the P.L.M. Railway with a view to obtaining the loan of one of these locomotives for the purpose of trial runs. The tests were to be carried out with a trailing weight of about 900 tons at a speed of 120 km. per hour (75 m.p.h.), on the section Bordeaux-Bayonne, which is 197.6 km., or 122.7 miles in length, and is equipped with overhead contact wire. This line has frequent gradients and inclines, with values up to a maximum of 1 in 182, and long straight stretches up to 45 km. (about 30 miles) in length, which are only interrupted by curves with a large radius, the latter being only in exceptional cases less than 800 m. (874 yards).

We have been supplied with the following report of the conditions and results of the tests carried out.

On the 24th February, shortly after its arrival at Bordeaux, the locomotive was run light over the section Bordeaux-Morcenx (108.5 km.—67.4 miles) at speeds up to 120 km. per hour (75 m.p.h.), and on the return journey it was used for hauling an express train of about 200 tons. During that run the commercial speed attained was 96 km. per hour (59.6 m.p.h.), without this necessitating the use of the parallel connection of motors. On the following day, a train representing a trailing weight of 600 tons and consisting of 16 four-axle coaches, was hauled. During this run, the following readings were taken on the locomotive instruments :—

| Connection of motors | Total current amperes | Pressure volts | Output at wheel rim h.p. | Speed | |
|---|---|---|---|---|---|
| | | | | km. per hour | miles per hour |
| Parallel .. .. .. .. | 2000 | 1350 | 3270 | 92 | 57 |
| Parallel with field reduction of 45 per cent. | 1920 | 1300 | 3030 | 107 | 66 |
| ,, ,, ,, 30 per cent. | 1720 | 1320 | 2760 | 112 | 69 |
| ,, ,, ,, 45 per cent. | 1920 | 1250 | 2900 | 115 | 71 |

The locomotive very soon gained the confidence of the Midi Railway authorities, and was transferred to the regular service, in which it was used for hauling the fastest express trains with trailing weights up to about 435 tons.

High Power Electric Locomotive of the P.L.M. Railway.

Some of the readings taken during these runs are given below :—

*Sud-Express.*—Train No. 41.

| | | Distance | | Average Speed | |
|---|---|---|---|---|---|
| | | km. | miles | km. per hour | miles per hour |
| Bordeaux | dep. 17.37 .. .. | | | | |
| Dax | arr. 19.06 .. .. | 147·5 | 91·6 | 100 | 62 |
| ,, | dep. 19.09 .. .. | | | | |
| Bayonne | arr. 19.41 .. .. | 50·1 | 31·1 | 94 | 58 |

Pyrenees-Cote d'Argent Express.—Train No. 48.

| | | Distance | | Average Speed | |
|---|---|---|---|---|---|
| | | km. | miles | km. per hour | miles per hour |
| Bayonne | dep. 22.34 .. .. | | | | |
| Dax | arr. 23.11 .. .. | 50·1 | 31·1 | 81 | 50 |
| ,, | dep. 23.23 .. .. | | | | |
| Bordeaux | arr. 1.12 .. .. | 147·5 | 91·6 | 81 | 50 |

Work on the permanent way and signals caused some long stoppages. In order to make up for lost time due to these causes, for instance, with train No. 41, the

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actual speed of 120 km. per hour (75 m.p.h.) had to be maintained over nearly the whole section—197.6 km. (122.7 miles) in length. During these runs a few readings were taken on the locomotive instruments; the values obtained are given in the following table :—

| Connection of motors | Total current amps. | Pressure volts | Output at wheel rim h.p. | Speed | |
|---|---|---|---|---|---|
| | | | | km. per hour | miles per hour |
| Parallel-series with field reduction of 45 per cent. .. .. .. | 1440 | 1450 | 2530 | 115 | 71 |
| ,, ,, ,, ,, | 900 | 1600 | 1740 | 102 | 63 |
| Parallel-series with full field .. | 1170 | 1500 | 2130 | 118 | 73 |
| ,, ,, ,, ,, .. | 1080 | 1490 | 1950 | 120 | 74 |

It may be noted that it was not necessary to resort to the parallel connection of motors for obtaining the specified speed with the load in question. As heavier loads were not provided for, in the case of ordinary express trains, special trains were formed with a trailing weight of 600 and 800 tons. As can be seen from the following table it was possible to reach speeds up to 120 km. per hour (75 m.p.h.), even with these heavy trains. Between Lamothe and Bordeaux (42.3 km.—26.2 miles), for instance, the train travelled at an average speed of 110 km. per hour (68 m.p.h.) for 23 minutes, while the Morcenx-Bordeaux section, 108.5 km. (67.4 miles) in length, was covered in exactly an hour. Even so, it was only seldom necessary to use the last reduced field step. It may be mentioned that a single pantograph was used for collecting current at all speeds up to about 1800 amps., two collectors being utilised only above that value of current. In all cases starting up took place without the slightest difficulty.

The following table gives particulars of the trial train with trailing weight of 600 tons.

| | | | Distance | | Average Speed | |
|---|---|---|---|---|---|---|
| | | | km. | miles | km. per hour | miles per hour |
| Bordeaux | dep. | 7.15 .. .. | | | | |
| Caudos | arr. | 7.51 .. .. | 51 | 31·6 | 85 | 52 |
| ,, | dep. | 7.59 .. .. | | | | |
| Morcenx | arr. | 8.37 .. .. | 57·5 | 35·7 | 91 | 56 |
| ,, | dep. | 8.54 .. .. | | | | |
| Dax | arr. | 9.28 .. .. | 39 | 24·2 | 69 | 42 |
| ,, | dep. | 9.30 .. .. | | | | |
| Bayonne | arr. | 10.01 .. .. | 50·1 | 31·1 | 97 | 60 |
| Bayonne | dep. | 11.14 .. .. | | | | |
| Dax | arr. | 11.46 .. .. | 50·1 | 31·1 | 94 | 58 |
| ,, | dep. | 11.52 .. .. | | | | |
| Morcenx | arr. | 12.27 .. .. | 39 | 24·2 | 67 | 41 |
| ,, | dep. | 12.31 .. .. | | | | |
| Bordeaux | arr. | 13.31 .. .. | 108·5 | 67·4 | 108·5 | 67·4 |

The performance with an 800 ton train was similar to that for the 600 ton train.

The corresponding electrical data are as follows :—

| Connection of Motors | Total Current amps. | Pressure Volts | Output at wheel rim h.p. | Speed | |
|---|---|---|---|---|---|
| | | | | km. per hour | miles per hour |
| Parallel-series with field reduction of 30 per cent. | 1800 | 1600 | 3520 | 80 | 49 |
| ,, ,, ,, 45 per cent. | 2000 | 1390 | 3370 | 104 | 64 |
| ,, ,, ,, 45 per cent. | 2000 | 1300 | 3170 | 112 | 69 |
| Parallel-series with full field .. | 660 | 1475 | 1030 | 120 | 74 |
| Parallel-series with field reduction of 45 per cent. .. .. .. | 2320 | 1430 | 4050 | 113 | 70 |
| Parallel-series with full field .. | 2560 | 1450 | 4550 | 85 | 53 |
| Parallel-series with field reduction of 30 per cent. .. .. .. | 2520 | 1350 | 4150 | 100 | 62 |

The readings taken from time to time on the locomotive instruments during these runs gave as maximum output of locomotive at wheel rim, 4550 h.p. in the case of parallel-series connection of motors, at 1450 volts and 85 km. per hour (53 m.p.h.). Speeds of 120 km. per hour (75 m.p.h.) were reached several times and maintained even over long stretches.

On the Dax-Morcenx section the pressure drop in the contact line was exceptionally high, owing to the fact that one sub-station was not running, the pressure at overhead line being down to about 700 volts; consequently the average speed during this test, as well as during all the other trial runs, was very small on that section.

Unfortunately, the original programme which provided for the hauling of trains with a trailing weight up to 900 tons at 120 km. per hour (75 m.p.h.) could not be carried out, as the sub-stations were not in a position to supply a sufficiently large current. The full output of the locomotive, i.e., 5400 h.p. at 1500 volts, could therefore not be reached at these tests. After some 4200 km. (2610 miles) had been covered, the tests were concluded, and the locomotive was returned to the Mt. Cenis line, the journey up to Toulouse being made under its own power.

In addition to the prominent officials of the two railway companies directly concerned, other leading railway engineers attended the tests and were impressed by the excellent running qualities and good behaviour of the locomotive.

## THE ROAD TRAFFIC BILL.

### Views of the Minister of Transport.

Mr. Herbert Morrison, the Minister of Transport, speaking at the annual dinner of the Association of Municipal Corporations in London on July 9, congratulated the Association and its colleagues of the Municipal Tramways and Transport Association on being within sight of securing those wider powers for municipal transport undertakings for which they had fought for many years. It was a great gratification for him personally that during his first Parliamentary session as Minister he had been able to embody the desired principles in the Road Traffic Bill. Under the old conditions a municipality had, as regards transport, worked under a great disadvantage as compared with private enterprise. The new order of things embodied in the Road Traffic Bill had become essential.

The municipalities would be no longer licensing authorities, as the 1,300 existing licensing authorities would be abolished and twelve area traffic commissions set up in their place. The new provisions were going to be an important factor in co-ordination between various public transport undertakings and private undertakings. The outstanding duty of the new traffic commissioners would be co-ordination, and the municipalities could appear before them on a basis of equality with private undertakings and with the necessary elastic powers to make working agreements not only between municipality and municipality, but between municipality and private undertaking. He, therefore, believed that Part V of the Road Traffic Bill, taken in conjunction with Part IV which dealt with the regulation of public service vehicles, would be a great inducement to transport efficiency, justice, and economy. Although neither private undertakings nor the municipalities nor himself were entirely satisfied with all the details of the arrangement, they had arrived at a compromise which, in the judgment of all of them, was reasonably fair. In view of the compromise he was now confident that the House of Lords would now also enter into the spirit of the agreement and let Part V stand in its revised form as part of the Road Traffic Bill, which as a whole would constitute a great legislative milestone and do much for the better organisation and safety of traffic on the roads. The settlement was a tribute to the parliamentary power of united local government.

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## SOUTHERN RAILWAY ELECTRIFICATION.

CONVERSION OF 800 MILES OF LINE AT A COST OF £12,750,000.

The Southern Railway has now become the largest electric railway in the world. Its electrified track totals 800 miles, the cost of the conversion having been £12,750,000. To inaugurate the latest extensions, special trains were run on July 7 from London termini to Windsor and Gravesend, where the civic authorities welcomed Brigadier-General Everard Baring and other representatives of the company, and their guests.

The Windsor extension is a continuation of the Waterloo branch to Twickenham and Hounslow, and is 27½ miles in length. The cost of this section was £367,000. The Dartford-Gravesend electrification extends over 14 miles, and the outlay was £160,000. A third extension was opened on July 6, namely from Wimbledon to West Croydon, a distance of eight miles, the cost of electrification being £73,000.

An interesting fact concerning the Windsor electrification is that it has been completed in a summer which has witnessed the inauguration of express omnibus services by three companies, each running four times an hour, between the royal borough and central London. An indication of the heavy nature of the traffic to Windsor was given by Lt.-Col. S. Wright, the Mayor of Windsor, in his welcome to the railway representatives. His Worship mentioned that on bank holidays the borough received nearly 40,000 visitors, and the electrification, he said, would mark a further definite improvement in dealing with the crowds of people. This aspect of the enterprise was referred to later on by the chairman of the Southern Railway. There was not, he said, much difficulty in securing traffic when suburban lines were electrified. The difficulty was to deal with the traffic, but that task their officers were quite equal to.

The opening of these extensions marked, the chairman added, the completion of the scheme approved by the directors seven years ago, namely, the electrification of all the inner and outer districts on the third rail system, which was originally adopted by the old South-Western Company for the Waterloo to Wimbledon and other sections. The third rail system meant the scrapping of an expenditure of the million and a quarter pounds which had been spent on the electrification on the overhead system of suburban sections of the London-Brighton Railway, but he thought it was a common-sense plan that the companies which were grouped by the amalgamation scheme of 1921 should work on the same electric system. Further, they were able to-day to use the rolling-stock from one end of the line to the other.

Electrification from London to Brighton and Worthing is the next task of the company. In the words of their chairman, the directors have taken it up with a light heart, and with a very much lighter call on the company's purse. In other words, the conversion of the main line from London to Brighton has been facilitated by the action of the Government in remitting the passenger duty. This duty capitalised, amounts to approximately £2,000,000, so that the amount available for improvements is not far short of £1,600,000. In return for this remission the company guaranteed to undertake an expenditure on improvements equivalent to 80 per cent. of the capitalised amount of the remitted passenger duty.

The projected extensions, work on which will be begun in the future, comprise the following :—

(1) The main line throughout from London to Brighton. Out of a total route mileage of 51, the 16 miles from Victoria to Coulsdon have been worked on the electric system for some time.

(2) The line from Preston Park (on the London-Brighton main line) to Hove and Worthing, a distance of 11 miles.

(3) The line from Redhill (on the London-Brighton main line) to Guildford, via Reigate and Dorking Town, 20 miles. Guildford is already served by electric trains from Waterloo, via Wimbledon and Cobham.

The complete route, London to Worthing, via Brighton, will be the longest main line electric railway in Great Britain, and the first main line to be entirely equipped for electric working. The standard third rail direct-current system will be adopted, and the laying of the power rail will proceed simultaneously on the up and down roads, the work being arranged so that the steam trains are not interfered with. Many of the steam services to Brighton occupy only an hour each way. New rolling-stock will be provided, and it is understood that the multiple unit system, similar to that in use on existing electric lines, will be adopted.

If the war had not intervened the electrification to Brighton would probably have been effected some years ago on the 1,500 volt single phase overhead system.

As soon as the success of the extension on the third rail system is demonstrated, there is no doubt that the main line electric working will be extended to Lewes and Eastbourne, and in that event the claims of Hastings cannot be overlooked. Only a few weeks ago a local authority in the Canterbury district was reported to have been informed by a railway official that electrification to the Kent coast was under consideration.

## LONDON COUNTY COUNCIL TRAMWAYS.

EXTENSION OF PLANT AT GREENWICH POWER STATION.

At the meeting of the L.C.C. on July 8 it was decided, on the recommendation of the Highways Committee, to spend £450,000 on extending and replacing plant at Greenwich power station. The plant to be installed includes :—

(A) Twelve water-tube boilers and auxiliaries, each of approximately 50,000 lbs. an hour evaporative capacity and suitable for supplying steam at 500 lbs. a square inch at a temperature of about 750 degrees Fahrenheit.

(B) Two 20,000 kilowatt (maximum rating) high pressure turbo-alternators with condensing plant and auxiliaries.

The changes proposed will increase the capacity of the plant by 25,000 kw., and the Committee is satisfied that the additional energy can be generated at the station at a lower cost than it can be obtained from an outside authority. It is proposed to invite tenders for the supply of new boiler units, turbo-alternators, pipework, etc. The ultimate objective for the station is a working capacity of 80,000 kw. with a reserve capacity of 20,000 kw. It is now proposed to provide for a working capacity of 67,000 k.w with a reserve of 20,000 kw. The estimated cost of this part of the scheme is £450,000. A set-off against this expenditure, estimated to be at least £25,000 a year on the present loading, will probably be effected owing to the reduction in fuel consumption which may be anticipated from the new plant. The proposals will satisfy the requirements until 1938.

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## A TRAMWAY BOULEVARD AT SOUTHEND-ON-SEA.

PICTURESQUE AVENUE THAT ENCIRCLES THORPE BAY AND JOINS THE ESPLANADE.

Probably no municipal transport undertaking possesses a sleeper track tramway with up and down lines placed in more beautiful surroundings than the picturesque tramway boulevard of the Corporation of Southend-on-Sea. This is situated in Thorpe Bay, and it is a popular ride with both visitors and residents. Circular tours are provided by top-covered double-deck cars throughout the year, and in the summer toast-rack observation cars are popular.

As the photograph shows, the sleeper track is entirely covered with grass throughout its width, and the margins between the track and the roadway are thickly planted with a variety of trees and bushes. Many of these are evergreens, others are flowering trees, and at any time of the year the scene is very attractive.

The boulevard is probably the first of its type to be constructed in this country and was made in two sections. The first part was completed on July 30, 1913, and extends a distance of approximately three-quarters of a mile from Southchurch to Bournes Green. The other section, completed on July 16, 1914, runs from Bournes Green practically to the esplanade at Thorpe Bay. The cost of construction of the completed boulevard was approximately £30,000.

A Tramway Boulevard at Southend-on-Sea.

## TRAMWAY TO A BELFAST PLEASURE PARK.

The members of the Belfast Tramways Committee and Mr. Wm. Chamberlain, the general manager, are to be congratulated upon their efforts to popularise still further the Belfast gem known as Bellevue. This park and its gardens are situated on a pleasant tramway route, and their natural features alone are sufficient to attract visitors on fine evenings and at week-ends. It is a verdant and extensive municipal possession rising in terraces to a considerable height and surrounded by mountainous country.

The programme of attractions provided by the Tramways Department makes a strong appeal to the citizens. A bandstand, concert enclosure and tea-rooms are prominent features, and on Saturdays and during holidays special provision is made for the sixty thousand schoolchildren of the city. This extends even to setting apart a portion of the grounds for donkey rides, swings, roundabouts and other pastimes in which young folks delight. Cheap travelling for children is provided by the general manager's scheme for half-penny fares for any distance to and from Castle Junction. For older visitors the services of a golf instructor are available.

## UNDERGROUND GROUP DELEGATION TO U.S.A.

INSPECTION OF MANY TRANSPORT SYSTEMS.

The annual convention of the American Electric Railway Association at San Francisco from June 23 to 25 was attended by four representatives of the London Underground Group of companies. The delegates were Mr. George Shave, operating manager and chief engineer, London General Omnibus Co., Mr. J. H. Williams, divisional engineer, London General Omnibus Co.; Mr. A. A. M. Durrant, assistant superintendent rolling-stock, London General Omnibus Co.; and Mr. L. B. Hewitt, mechanical engineer, Metropolitan Electric Tramways, Ltd. Mr. Shave also represented the Commercial Motor Users' Association of which he is a vice-chairman.

Mr. Shave submitted to the Engineering Section a paper on "London Omnibuses and other Forms of Passenger Transportation," of which a summary is given elsewhere in this issue.

At the close of the convention the British delegates paid visits of inspection to the following transport undertakings: Los Angeles, Salt Lake City, Denver, Omaha, Kansas City, St. Louis, Chicago, Detroit, Cleveland, Pittsburgh, Buffalo, Albany, Newark, Philadelphia, Baltimore, Washington, Boston and New York.

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The Editor will consider contributions offered for publication in THE TRAMWAY AND RAILWAY WORLD (including the Omnibus and Coach Section) by those conversant with the subjects that come within the scope of this journal. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, JULY 17, 1930.

**Tramway Developments.** News items are from time to time circulated to the effect that this or that small town is abandoning its electric tramways and substituting omnibuses. The reason generally appears to be that the small tramway undertaking, through lack of sufficient traffic or other adverse causes, has been unable to build up a sufficient money reserve to pay for the renewals of its tracks which are now largely worn out. The case is quite different in the large cities. Here, instead of retrogression, tramway business is being intensified and developed almost out of recognition. Permanent way renewal has gone steadily on all the time, and successful efforts —at long last—are being made to provide cars capable of competing successfully in comfort and speed with any omnibuses. Let us take three examples. In addition to the modernising of their existing cars, the London County Council are now receiving 150 new cars which are the last word in speed, comfort, and safety. At the same time they propose to expend £450,000 on the extension and replacement of generating plant at their Greenwich power station which supplies the tramways. That points to still higher car speeds, a change which should not be delayed in view of the increased speeds to be allowed to omnibuses under the Road Traffic Bill. Then Leeds City Council have just placed an order, at a cost of about £165,000, for 100 new cars of the latest and most approved design. More speed will certainly not do Leeds tramways any harm. The third case to be here mentioned is that of Glasgow. For some considerable time the Corporation there have been pressing forward the reconstruction of existing cars, fitting them with more powerful motors, and by degrees acquiring new cars. This process is being accompanied by the installation of more powerful generating plant at the Pinkston station which supplies the tramways. The good work is also going on with renewed vigour in other cities. Tramway authorities are at length realising that if they provide the comfort and the speed now required by the public, omnibus competition becomes less formidable.

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**Anglo-Argentine Tramways.** In tramway circles in this country much interest is taken in the Anglo-Argentine Tramways Company, and in its work. It is a British company, and the magnitude of its operations is greater than that of any tramway undertaking in Britain. Centred in Buenos Aires, it has been in existence for over 50 years, and it has grown with the enormous growth of that city. But, as was fully pointed out at the last annual meeting of the company, Argentina, like other countries, is at present suffering from severe industrial and trade depression. This state of things is reflected in a decrease in the traffic carried by the company during 1929 as compared with the previous year. Other factors have been unfavourable. For one thing, omnibus competition has, as in other countries, greatly increased. Another feature common to many large cities is the acute and growing congestion of street traffic, and the company complain that the local authorities have done nothing of importance to lessen this trouble. What the company recommend is the widening of streets, the building of underground railways, and the co-ordination of traffic. These are just the things wanted also in London and elsewhere. Negotiations are proceeding between the company and the municipality for the construction of a new underground railway, and other comprehensive proposals are under discussion. These aim at a complete reorganisation of urban transport with full co-ordination. Sir George Touche, chairman of the company,

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who, to the great regret of his colleagues, is obliged to retire owing to indifferent health, expressed to the meeting his confidence that a new chapter is now opening, and that it will be one of great developments. This view is evidently based on the anticipation that the municipality will approve the company's great traffic reorganisation scheme. The general tone of other speeches at the meeting was also of a hopeful character. The Duke of Atholl succeeds to the chairmanship of the company.

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**Consultation with Tramway Employees.**

Should the works committees to be found in some British industries, or the co-operative shop movement of the Canadian railways, be introduced into tramway undertakings? At present difficulties with tramway employees sometimes develop into a threat of a strike before the headquarters of the union comes upon the scene to take up negotiations. We are not overlooking the valuable work accomplished on wider questions by the National Joint Industrial Council, which is composed of representatives of the employers and of the Union. That Council is not concerned, however, with questions of a local character such as would claim the attention of an individual undertaking and the Union. Nevertheless the success of the Council in dealing with problems that it met in the early years may be cited as a reason for setting up a local committee of employers and employees. Equally successful was the Conciliation Board composed of members of the council and employees, that existed in connection with London County Council Tramways before the war. In the general industrial sphere may also be found proofs of the usefulness of works committees. On the Canadian National Railways the co-operative shop movement seems to be increasingly successful. Sir Henry Thornton, the general manager, when in London in December last, expressed his appreciation of that movement, which he regarded as a development of the suggestion box system, a small committee in each shop discussing with the superintendent and his assistants such matters as safety, improved devices and methods that increase output and reduce costs. Sir Henry Thornton congratulated himself on the fact that when this scheme is fully developed, 90,000 men will be giving their brains to the company instead of merely their hands. Many years ago, Mr. C. J. Spencer, when general manager of the Bradford Corporation Tramways, set up a system of works committees, and in London, as manager of the tramways of the London Underground group, he has organized similar committees which have proved a valuable help in maintaining good relations between the companies and the employees. Interesting evidence on this aspect of the departure was lately given by Mr. Spencer before the Royal Commission on Labour in India, presided over by Mr. J. W. Whitley, a former Speaker, to whom British industry owes the inauguration of the National Joint Industrial Councils. Mr. Spencer has found that a works committee enables the management of a tramway company to keep in close touch with those concerned in operation, a facility which is of considerable value. Among other advantages, it enables minor things to be brought forward which the management might not have appreciated to be of common interest. It is important to emphasise the fact that a works committee is not intended either as a substitute for the trade union, or for relieving a general manager of his duties.

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**Automatic Stopping of Tramcars.**

Operation of tramcars on the one-man system has been experimented with to only a small extent in this country. Owing, probably, to the conditions which are in existence here the idea has not been extended to any marked degree, and in view of the number of motor omnibuses which are one-man operated this is somewhat surprising. In America and on the European continent the one-man tramcar has largely helped, by reducing running costs, to provide the means for a more intensive service to meet what is known as rubber-tyred competition. Moreover, the scheme has met with the approval of the passengers, who are not slow to realise that they benefit from innovations designed to effect economies in working. Under no circumstances, however, is any economy justified unless and until its relationship to public safety has been made the first and foremost consideration. It is open to question whether this has been the case with regard to one-man operation of motor omnibuses. Under the control of an able driver,

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using reasonable care, the omnibus may be regarded as the safest self-propelled vehicle, but the lack of provision for an emergency, such as the sudden collapse of the driver, must sooner or later engage the attention of the proper authorities. In such a case the passengers, entirely at the mercy of the machine, would most likely be involved in disaster. With the tramcar, such a possibility can be completely and effectively guarded against. The tramcar, following as it does its own track, can be provided with means for bringing it to rest automatically and without the agency of the driver, provision being made for this automatic device to be operated by the passenger in an emergency. Arrangements such as these are very proper, particularly in the case of one-man vehicles. The method by which this provision has been made by the Paris Public Transport Company cannot fail to be of interest. The automatic means for bringing a tramcar to rest in case of emergency, ingeniously includes interruption of the traction circuit, sanding of the track, application of the brakes, unfastening of the doors and the ringing of alarm bells. It will thus be seen that the company aims at a high degree of public safety. The success of the experiments, which has led to an extension of the system, has gone far towards the solution of the problem of one-man operation, and will doubtless prove of especial value in further reducing running costs of what is still the cheapest form of public transport.

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**No Channel Tunnel.**

After the debate in the House of Commons on June 30, on a motion in favour of the principle of the proposal, it may safely be predicted that within the lifetime of the present generation no tunnel will be constructed between Dover and Calais. It is true that the motion was defeated by a majority of only seven votes, but that was because the matter was left to a free vote of the House, and members voted as they liked, unshackled by party ties. The Government were opposed to the scheme, and as on previous occasions, the leaders of all political parties were also against it. Probably most people will admit that the weight of the arguments used was against the scheme. First, there was the damning with faint praise in the report of the committee of experts who recently examined the project anew. Second, there was the absence of any general support from the country. Third, the Prime Minister and the Minister of Transport skilfully marshalled telling arguments against the scheme. These included engineering doubts, financial and economic considerations, doubt as to any commensurate trade advantages, and the powerful objections from the military point of view. According to some of the speakers—and there was something in their argument—the main or only tangible advantage of the tunnel would be that it would enable passengers to make the crossing without the risk of sea-sickness. Many millions of money were to be spent for this purpose. Some other points not dwelt on in the debate might be emphasised. The size, speed, and comfort of the cross-channel steamers go on increasing. Traffic by air is continually developing. As to the transport of goods, there is such a thing in prosperous existence as the Harwich-Holland train ferry. Is there any particular reason why there should not be a Dover-Calais train ferry? Its cost would be a flea-bite compared to that of a tunnel. Yet the pertinacity of the advocates of the tunnel is amazing. For some 50 years they have been urging its construction. How in the earlier years they proposed that the trains in the tunnel should be propelled does not seem clear. There was no electric traction in those days, and steam locomotives would be clearly impossible. Successive British Governments have resisted the scheme, and successive British Governments are likely to resist it in the future.

## BELFAST MANAGER AWARDED DAMAGES.

In the King's Bench Division of Northern Ireland, on June 18, a verdict for the plaintiff, with £100 damages, was returned in an action brought by Mr. William Chamberlain, general manager of Belfast Corporation Tramways and Omnibuses, against Alderman W. H. Alexander. Plaintiff alleged that defendant libelled him in a letter to the newspapers which referred to Corporation omnibuses as having been put off the streets by the police on the ground of mechanical unfitness. It was further alleged that gross negligence had been attributed to plaintiff in the discharge of his duties.

The Lord Chief Justice, in his summing up, said the manager could not carry on if he was to be bullied by individual members of the Council. He disapproved of the Alderman's action in going to a foreman and trying to make the man directly responsible to him. The statements made by defendant could not be justified. On the question of damages, plaintiff had suffered by being accused of having omnibuses under his control which were a crime to have on the road. For that he ought to get reasonable damages which would clear his character. The jury, he thought, should not give a less sum than £50, so that it could not be said the damages were contemptuous.

The jury answered the questions left to them as follows: (1) Do the words complained of refer to plaintiff as tramway manager? Yes. (2) Do the words mean that plaintiff has been guilty of gross negligence as tramway manager and had imperilled the lives and limbs of thousands of citizens? Yes.

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# SOME ASPECTS OF TRAMCAR DEVELOPMENT*

*By* **L. E. HARVEY,**

*General Manager and Engineer, Ilford Corporation Tramways.*

I do not know why I have been asked by the Council to take on this job, unless it is that on one or two occasions I have had the temerity to call attention to the fact that at our Annual Conferences there is very little allusion made to tramcars, and no attempt to exhibit any improvements or new gadgets in connection with them. Indeed, it is with great diffidence that I address you because I feel that there are many of you who from your larger experience are more fitted to speak on the subject.

I propose, therefore, to speak of the merits of only such things as I have been in actual contact with, and I crave indulgence if the personal element somewhat predominates. I would ask members to afterwards supplement my remarks by giving descriptions of any other improvements that they themselves have used or may know of. I am a thorough believer in roller and ball bearings wherever they can be applied in tramcar equipment, and I am, therefore, firstly going to allude to a few applications.

### Roller Axle Bearings.

Here let me say that in spite of some members' contrary experiences I am convinced that they are good.

Some years ago I started experimenting and I had, amongst others, twenty modern cars, identical in construction, equipment and weight—64-seaters, bodies by the Brush Co., equipments by the B.T.H. Co., 4-wheel trucks by Peckham Truck Co., and all fitted with car meters of C. & H. make. Ten of these cars I equipped with Hoffmann's roller axle bearings and ten had ordinary gun-metal bearings with thrust plates. The cars were used on promiscuous routes by promiscuous motormen over a period of two years. Under these conditions it must be agreed that a nearly perfect average comparison was obtained. The result was that the roller bearing cars came out with 8 per cent. saving in current, and reckoning 40,000 miles per car per annum at 1.5 units per car mile and current at 1d. per unit, this equals a saving per car per annum of £25 in current, and in addition to this there is the saving of axle brasses and thrust plates, oil, packing and labour, say £6. Total, £31 per car per year. The prime cost of the roller bearings is saved in about three years. I then fitted the other cars up with rollers, and I have had no reason to regret it.

With regard to wear I had one of Hoffmann's boxes taken down by their representative a few months ago, after being in use for six years, and we could detect no appreciable wear in any part. I may add that I am now trying out a simplified type of axle bearing by Hoffmann in which the ball bearing location ring is done away with and the location effected by the two roller rings themselves. This is proving quite a success and it cheapens the cost of the bearing. Their latest type is a still further improvement whereby the taper end to the axle and its corresponding tapered and hardened sleeve is eliminated and the bearing is fixed to the ordinary parallel axle end.

I have one car fitted with another maker's bearings, but the rollers have had to be renewed and I do not consider this type equal to Hoffmann's.

### Roller Armature Bearings.

With regard to roller bearings for armatures I find that the cost of converting present motor cases is very excessive, but if I were buying new motors I should certainly use them, as although it is my opinion that no saving in current would be effected, owing to high speed, the advantages appear to me to lie in the fact that you always have a constant air gap between the armature coils and the pole pieces, and also that pinions have more constant mesh into gears.

### Trolley Heads and Ball Bearings.

I have always held the opinion that trolley heads are the most neglected, but should be the most cared for part of tramcar equipment. No expense should be spared in first cost or in maintenance to ensure absolute freedom from trouble or accident—too often the work is relegated to a glorified labourer, whereas an experienced and properly trained man is required and he should not hesitate to change the head on the slightest appearance of undue wear or slogger. In Ilford I am glad to say we do not have more than six de-wirements in a year.

I think that the trolley head should be fitted with ball bearings in the wheel as well as in the spindle. The small-sized wheel used in this country cannot keep pace with the speed of the car, and in consequence there must always be drag and undue wear both on wheel and wire. I have been experimenting for a long time in conjunction with Hoffmann's and the head I have here is the result.

It is, of course, necessary to insulate the balls and races of the wheel as otherwise they soon get pitted with the current and rapidly wear. Some other method of collecting the current must therefore be devised. To effect this a spring actuated carbon brush bears on each side of the hub of the wheel. The ball bearing itself is enclosed in an ebonite box or casing. In addition there are steel races top and bottom for the main globe and I keep these up to

Mr. L. E. Harvey.
General Manager and Engineer, Ilford Corporation Tramways.

their work by a thackray spring washer retained by a cotter pin on the plain spindle, and there is a rim on the globe overlapping the races to prevent rain washing away the grease. The life of the wheels is about 10,000 miles, and the hubs upon which the brushes bear will last out two wheels. The wheel exhibited ran 11,572 miles in 87 days. A wheel taken off last week ran 10,167 miles and was not quite worn down to gauge. The whole wheel is easily taken adrift for renewal, and the head itself can be quickly dismantled after first loosening and sliding back the guard on the harp, the object of the guard being to prevent any chance of the trolley wire being trapped in the head.

### Brake Spindles and Ball Bearings.

The method of supporting the top of the hand brake spindle to the top dash rail is crude. It gets worn and rattles, and there is danger of grease getting on to passengers' clothing, etc. I have adopted a ball bearing which I make myself and which I exhibit.

*A paper read at the annual meeting of the Manager's Section of the Municipal Tramways and Transport Association, and is given in full in this issue by special permission.

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I also put a ball thrust race underneath the foot ratchet wheel, and between it and the bottom casing. The whole arrangement is a great improvement.

### The Toggle Brake.

One of the most interesting exhibits this afternoon is the new Toggle Brake. This is of German origin, but is now made for the most part at the Brush Works, and marketed by the Peckham Truck and Engineering Co. It has been installed on thousands of cars on the Continent for about three or more years. The figures to date are 11,000 sets fitted to trucks, of which 2,500 are of the Peckham patent type. I have visited the works at Remsheid, near Dusseldorf, and seen hundreds of sets of all types in process of manufacture.

There are several forms, but the particular type I am adopting consists of two steel discs about 20 in. diameter and 8 in. apart, one of which is cast integral with the wheel centre and the other is keyed or pressed on to the axle. Between these discs are situated four friction shoes or pads which are forced apart and pressed upon the discs by means of toggle levers. The leverage is high and all the parts are heavily built. A pull of 36 lb. on the brake handle gives a pressure of 17,600 lb. on the eight brake pads or 73 lb. per sq. in. of pad surface. A 64-seater top-cover car can be pulled up with no exertion in about 40 ft., a retardation of 5–6 ft. per sec. being obtained on a dry rail with no sand. The brake pads themselves are made of a material somewhat similar to ferodo, and are originally 14 mm. thick and can wear down to 3–4 mm. The first set I had went about 21,540 miles when I took them off. as I found the truck was slightly out of square, causing the pads to wear unevenly. They were not nearly worn out, however. The cost of renewal of the pads is small and a fractional adjustment for wear is needed only about once a fortnight. Apart from the merits of this apparatus as a powerful and reliable brake the great advantage is that it saves the cost of all brake blocks and the necessary labour of changing them, and nightly inspection and adjustment; and, moreover, the rolled skin of the tyre is not disturbed by the abrasion of the brake block and sharp road grit, and as a consequence the surface of the tyre gets glass hard, and its life is prolonged. Moreover, the flange of the wheel tends to keep its shape much better because it is not worn down by brake blocks. Another advantage is the absence of complaints from motormen on the road that their brakes want adjustment. It is well known that when a set of new brake blocks is fitted overnight that during the first day's run these get bedded down and consequently soon require adjustment. Another point of advantage is that motormen prefer to use a hand-operated brake as a service brake provided it is effective and easily operated, which the brake in question undoubtedly is. This being so, it is probable that it would have a considerable influence on the wear of the rail.

The secret of success with this brake in my opinion lies in getting a perfect mirror-like surface ground on the brake discs at first. I use a high-speed direct-driven emery wheel fixed to the slide rest of the wheel lathe to obtain the polish—under these conditions the pads have a long life and the temperature rise after 17 hours' summer service is only about 70° fahr. I reckon the prime cost is saved in two to three years, basing the figure upon a saving of say 48 blocks per annum, and the labour of changing them and of nightly adjustment.

### Upper Saloon Windows.

Another interesting exhibit will be the windows of the upper saloons. The archaic arrangement of rack and wheel operated by the conductor is cumbersome and troublesome in the extreme, and the individually balanced window is little better. I have been working on this for a long time and in conjunction with Messrs. Beckett, Laycock & Watkinson, Ltd., the sliding window which you see has been evolved.

The merits are fairly apparent:—

- It is easily operated by the passenger.
- When closed it is rain and draught proof when the car is travelling in either direction.
- It allows an unobstructed view of the ground.
- It lets in the maximum of light—its frame being narrow.
- It lessens considerably the total weight of the upper saloon as the double side casing is done away with.
- It is rattle proof.
- It remains in any position where put.

And chiefly:—

- It adds 4½ in. to 5 in. to the interior width of the upper saloon giving more comfortable seating and a wider gangway.

It can be made in a metal frame of required size to put into a given window space, or can be built into the top cover as you will see them on your visit to the works.

### Conductors' Bells.

Most of you are well acquainted with the "Numa" air bell. I have here an improved type which I am using, and which has been supplied by the Equipment & Engineering Co. There is a danger with copper piping of crystallisation and fracture at corners, and with iron piping of oxide or flakes getting into the bell piston. The new idea of 5-ply rubber is easy of application and can be run like interior wiring—it is very durable, cheap and easy of renewal. I have adopted the system whereby the passenger-operated push rings the bells at both ends of the car so that the conductor is warned as well as motorman.

### Ventilation.

I do not think the last word has been heard on this subject. I have here two forms supplied by the Peckham Truck & Engineering Co. The one is called "Anemostat" and consists of an exterior funnel facing the direction of motion of car—collecting air and passing it through a tube to an interior distributing funnel—giving no draught. I have been trying to obtain some sort of disinfecting tablet to place in the tube in the path of the air current in order to infuse a cleanly and continuous smell in the car interior. This would be better than occasional spraying with deodorisers, and I hope to be able to exhibit this to you.

The other type of ventilator is the "Flettner" and is in this case an extractor of the used air. It is run on ball bearings, and continues to function for a reasonable time at car stopping places and is certainly very effective. I have no personal knowledge of the "Ashanco," but believe it is very well spoken of as is also the "Airvac," and I should like to hear the opinions of users. The Brush Co. have a new patent type consisting of adjustable panels over the windows, of which a sample is exhibited and which may be seen in actual position on cars at the works.

### Hand Rails and Stanchions.

Along with many other managers I have been trying out something to take the place of brass rails and stanchions, and to do away with their constant expense in cleaning. I have tried moulded "Doverite," but in spite of its high cost have had no lasting success. It cracks off, particularly near joints and supports, and the sharp edges are very dangerous to hands and gloves. I have tried different enamels, but these do not stay the course. I have now adopted nickel or chromium plating, all iron parts first being plated with copper—this is good, the stanchions being conspicuous and the only cleaning necessary being an occasional rub with a soft dry rag.

### Step Treads and Doors.

This is an important matter from the accident point of view—the ordinary nosed iron treading wears smooth and slippery on the edge and the passenger's foot is liable to slip sideways. I have tried all ways of roughening the edges, but with no success. I have also tried the open grid-iron type of step, but I do not like it. I have now been experimenting with ¾-in. sq. section hard wood slats screwed diagonally on the step, and also with ½-in. layers of hard wood screwed to the surface of the step with the grain at right-angles giving a rough edge to grip the boot, the layers being cheaply and easily renewed, and I believe this will prove an advantage.

### The Doors.

These should be properly looked after. I suspend them from ball race tracks at top and retain those in lower saloon open and closed by patent catches, doing away with troublesome locks.

### Seating.

In spite of general opinion I am still a firm believer in longitudinal seats for the lower saloon. There is more room for conductor and passengers to pass and more space for standing. Passengers can alight quicker as they have not to wait for the inner passenger on a double seat to get up out of the way. I use a moquette-covered spring seat by G. D. Peters & Co., but the vacuum cleaning of them is a considerable item and it is a question as to whether real leather would not be cheaper in the end. Immitation leathers I have no regard for. I have tried them, but sooner or later they develop cracks and the surface roughens.

For the upper saloon I have adopted a real leather spring seat; the rails supporting the padded leather back come through slots in the seat—this in effect gives another 2 in. to the available width of seat and also gives a clearer gangway.

### Conductors' Ticket Boxes.

I use the "Jew" type of box which on opening the lid exposes all the tickets on a slope, and the numbers of each pack can readily be taken by the clerks without having to handle each one.

### Used-Ticket Boxes.

I have been experimenting with a cylindrical fine wire mesh type attached to the dash board near the stanchion. I find that it is not substantial enough and is troublesome in maintenance; and in any case the trouble is to get the passengers to put the old tickets in them. I note that the London General Omnibuses exhibit a notice asking passengers to leave their tickets on the omnibus before alighting, in order to prevent littering the streets. I believe this is the only practical solution of the difficulty.

### Lamps.

I hope that by this time all undertakings (except Glasgow with its six-lamp series) are using standard voltage lamps. The new B.E.S.A. specification includes gas-filled 40 and 60 watt for 100, 110, 120 and 130 volts. Owing to the large variation in traction

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voltage and severe conditions of vibration it has not been possible to devise a suitable life test for traction lamps and reliance must be placed on certain tests for quality laid down in the specification.

There is one point about the use of gas-filled lamps that should be watched. Their temperature is high and their position in the car and distance from roof, etc., should be carefully chosen to provide some sort of ventilation to carry off the heat, and if necessary holes should be provided above the fittings leading to ventilator ducts, etc.

REFLECTORS AND SHADES.

I have yet to find a really satisfactory lamp shade or reflector. In my opinion lightness in weight is essential. There is always the risk of something working loose and dropping on a passenger. I have been trying an aluminium shade pierced with large holes allowing a proportion of light to go upwards, and be reflected down again from a white enamelled ceiling. The snag here is that aluminium is a most unsatisfactory metal to retain a high polish, it rapidly oxidises in the warm or damp atmosphere of a car. It occurs to me that stainless steel stampings might get over this difficulty.

HEADLIGHTS AND FOG LIGHTS.

I should like to hear some opinions on these. I believe several undertakings are trying out yellow reflectors for fog, and also fixing rear yellow lights to warn following traffic.

SAND GEAR.

The ordinary type of rubber sand pipe that is used with the sanding gear on the car is, in my opinion, wrong in principle, particularly because on curves the sand is thrown completely clear of the rail. I therefore use a wrought-iron pipe, rigidly fixed on the underside of the hopper, and this is curved so that the mouthpiece is right underneath the wheel itself, similar to the system obtaining on steam locomotives.

In order to clear these pipes, I provide on each car a flexible drain rod of spring steel wire of about $\frac{3}{4}$ in. exterior diameter.

WHEEL TYRES.

I still turn my tyres with a reverse cone of $\frac{1}{16}$ in., with the result that jazzing is completely absent and the table of the rail is quite flat. I must confess I never could understand the object of the 1 in 20 cone in the standard specification.

I cannot speak personally about new workshop equipment as my job is too small to be able to afford the beautiful modern machine tools that are now available. I would, however, like to say a word about the usefulness of the electric welder in the workshop. There is really hardly any need for a scrap-iron heap nowadays. Worn parts of all descriptions can be built up—motor cases, bearing lugs, gear cases, horn gaps in truck frames, etc., etc. I can also speak well of an electrically-driven air compressor for concrete breaking, by Reavell. This takes its current from the trolley wire by a fishing rod arrangement fixed to the machine. It is very compact and the machine, apart from the breaker, is practically silent.

OVERHEAD EQUIPMENT.

The Joint Committee has been sitting regularly and considering matters that have cropped up from time to time. They have just completed the drawings for Bow Collector Fittings. There is no doubt that where bows can be employed they are a very great improvement over the trolley head—wear on wire is reduced enormously, maintenance is very small and risk of accident minimised.

In conclusion, I would say that I hope I have not bored you too much by my personal point of view. Many of the things I have alluded to will be familiar to you, but perchance some of the things may be new to a few and I should be pleased to give any further particulars if required.

## MR. GEORGE SHAVE AT THE AMERICAN CONVENTION.

A PAPER ON LONDON OMNIBUSES AND OTHER FORMS OF TRANSPORTATION.

During the proceedings of the Engineering Section of the American Electric Railway Convention held at San Francisco on June 23, Mr. George Shave, operating manager and chief engineer of the London General Omnibus Co., submitted a paper entitled: "London Omnibuses and Other Forms of Passenger Transportation." Dealing with urban transport, Mr. Shave was of opinion that underground railways would ultimately prove the biggest factor in the solution of the congestion that existed in most of the large towns. Surface vehicles must be of high average speed and must offer a high degree of comfort, particularly as private car competition was increasing. In stating what he considered to be the disadvantages of tramways, the author added a new aspect to the drawback of being unable to deviate from line of route. Omnibus operating experience, he said, had shown that if full advantage was to be taken of traffic offered, an entirely different programme of routing was necessary on a Saturday as compared with the ordinary working days, with a further change on Sundays. Those alterations were denied to the tramway. So far as London was concerned it was only by the London Traffic Act restriction of omnibus services over tramway routes that the tramway undertakings had averted bankruptcy. The principal deterrent to scrapping was the capital that had been sunk in the permanent way, power station and equipment. This had led to the introduction of the trolley bus. Where traffic was not too dense this vehicle was a satisfactory expedient, but it was less mobile than the motor omnibus. Therefore he believed that the trolley bus would be largely of a transitory nature. He could not believe that any undertaking contemplating the initiation of a new system would consider the adoption of the trolley bus in preference to the petrol omnibus. He denied that its all-in operating costs was appreciably greater than that of the tramcar and the trolley bus, provided there was sufficient staff allocation and economical maintenance. The objection of short life and high depreciation did not constitute a serious item if a scientific system of repair and overhaul were followed. The rapid development of design and construction made it desirable to substitute up-to-date vehicles for those which in four or five years became obsolete. Long life with the tramcar had proved a disadvantage, as the design became obsolete as quickly as with an omnibus, if not in operation, certainly in appearance and comfort. Charges of slow acceleration, discomfort caused by gear changing, and noise did not apply to modern omnibuses. There was the alternative of the petrol-electric drive, which gave high rates of acceleration without gear changing, but at somewhat higher running costs. As to the argument that an omnibus could not compete with a tramcar in the handling of peak loads, Mr. Shave stated that experience in London with six-wheel double deckers had satisfied him that this vehicle was able to compete with tramways and even give a superior service. The most satisfactory size of vehicle for town or through-town service was a 50-seat body on a four-wheel chassis. For longer services a 70-seat omnibus offered the best solution. Adverting to future developments, the author affirmed that the biggest step would lie in the adoption of the heavy oil engine.

## THE LATE MR. P. J. PRINGLE.

SUDDEN DEATH WHILE TRAVELLING TO ENGLAND FROM AUSTRALIA.

Much regret was occasioned in transport and electrical circle, by the news of the sudden death of Mr. Percival John Pringles chief engineer and general manager of the Electric Supply Co. of Victoria, Ltd., Australia. Mr. Pringle, who was sixty years of age, was travelling to England with Mrs. Pringle to spend a long vacation. After motoring through Spain and France he stopped at Zurich, Switzerland, where he was seized with illness, and died on June 10.

Mr. Pringle received his appointment at Ballarat and Bendigo in 1911, and with the all-round experience he had gained in filling important positions in England, he proved very successful in the steps which he took for developing the tramways and electric supply in Victoria.

During his nineteen years' service he also became prominent as an authority on labour matters. On a number of occasions he was asked to act as arbitrator in disputes of traffic employees in Australia. The Commonwealth Government sought his advice on electricity supply problems as well as on labour matters. Although a busy man he was able occasionally to employ his pen in keeping the tramway industry in Great Britain acquainted with progress in the wider field of the State of Victoria and the Australian Commonwealth. Several of his communications were published in THE TRAMWAY AND RAILWAY WORLD.

In early life Mr. Pringle attended the school of electrical engineering in Hanover Square, going from there to Glasgow to serve as a pupil in locomotive works. Subsequently he assisted Prof. G. Forbes in electrical research. Following experience gained in electrical engineering work with Messrs. Drake & Gorham and the Brush Electrical Engineering Co., Mr. Pringle supervised the equipment of power stations at Wandsworth, Watford, Sheffield, Huddersfield and Leicester. Then for three years he was associated with Messrs. Kincaid Waller, Manville & Dawson, the consulting engineers, and was engaged in the task of setting up the Midland Electric Power Corporation's works. His last appointment in this country was at Burton-on-Trent, where in 1903 he became borough electrical engineer and tramways manager. In that capacity Mr. Pringle was successful in inducing breweries and works to adopt electric power. During the eight years he spent at Burton he patented several inventions in the electricity and tramways departments. Mr. Pringle was a member of the Institution of Electrical Engineers, the Institution of Mechanical Engineers, and a member of the Council of the Light Railways and Tramways Association.

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# INTERNATIONAL TRAMWAYS CONGRESS AT WARSAW.

## An Assembly of 350 Delegates Representing Twenty-one Countries.

The twenty-first International Tramways and Light Railways Congress was held in Warsaw from June 30 to July 2 inclusive, and was attended by 350 delegates from twenty-one countries. The premises of the Society of Engineers and the Municipal Hall were used as meeting places for the Congress, which is a biennial event held under the auspices of the Union International de Tramways de Chemins-de-fer d'Intérêt Local et de Transports Publics Automobiles. This organisation includes in its membership a very large number of municipal authorities and companies operating tramways throughout the continent of Europe and elsewhere.

The object of the Union is to encourage progress in tramway, light railway, and public automobile services, particularly by the investigation of all technical and economic phases of their operation. During the past forty years it has held biennial congresses in many of the great cities of Europe, including London, where it met in 1902, on the occasion of an International Tramways and Light Railways Exhibition, organised by The Tramway and Railway World.

Only two British tramway undertakings were represented at this year's Congress, viz., Glasgow and Manchester.

The Delegates laying a Wreath on the Tomb of the Unknown Warrior at Warsaw, June 30.

The following were the delegates from Glasgow :—

- Bailie J. H. Stevenson, vice-chairman, Glasgow Transport Committee.
- Bailie G. W. Hunter, member of Glasgow Transport Committee.
- Councillor R. F. Smith, Glasgow Corporation Transport Committee.

Manchester was represented by the following :—

- Councillor Isaac Brassington, chairman of Manchester Corporation Transport Committee.
- Councillor T. H. Adams, member of Manchester Corporation Transport Committee.
- Mr. R. Stuart Pilcher, general manager of Manchester Corporation Transport Department.

Mr. Frank Ayton, managing director of Ransomes, Sims & Jefferies, Ltd., of Ipswich, and Mr. W. L. Lorkin, director of The Equipment and Engineering Co., Ltd., of London, represented British manufacturers.

The Warsaw Congress was held under the patronage of the President of the Polish Republic (Professor Ignacy Moscicki) and Field-marshal Pilsudski. Delegates assembled a day prior to the formal opening in order to hear from the organisation committee the final arrangements regarding the programme. In the evening they were entertained by the International Union. To celebrate the occasion all the tramcars of Warsaw were decorated with the flags of the various nations represented.

### Welcome by the Minister of Railways.

The official opening took place on June 30 at the Municipal Hall, when the Prime Minister of Poland, Mr. V. Slawek, presided. On his right was the President of the International Union, Engineer F. de Lancker, Director of the Brussels Tramways, and on his left the Minister of Railways, Mr. A. Kühn; the Vice-President of Warsaw Municipality, Mr. T. Szpotanski; the ex-Minister of Railways, Engineer K. Tyszka; the President of the Polish Union of Transport Undertakings, Mr. Budskiewicz; and the Director of Warsaw Tramways, Mr. L. Fuchs.

The chairman read a telegram of welcome from Field-marshal Pilsudski, and in a lengthy speech expressed the pleasure the delegates felt that the Congress was being held in the capital of Poland.

On behalf of the Polish Government the delegates were then welcomed by the Minister of Railways, Mr. A. Kühn; on behalf of the city of Warsaw, by Mr. T. Szpotanski; and on behalf of the Polish Union of Transport Undertakings, by Director Budskiewicz.

At the conclusion of the formal opening ceremony, the technical work was begun. Throughout the meetings all reports read in French were translated into German and those in German were translated into French, these two languages being the official languages of the Union.

### The Congress Proceedings.

The first technical session was held at the premises of the Society of Engineers, when a paper was submitted by Mr. E. Jayot, director-general of transport, Paris, giving "Comparisons of Capital Costs, Working Costs, Traffic, etc., of Railway Transport Above and Below the Surface." This was followed by a report by Mr. W. Pforr, director of the Berlin Traffic Co. on "Experiments in the Braking of Tramcars." In the afternoon session on June 30, three papers were presented. "Methods and Appliances for the Supply of Current to an Electric Tramway System" was the subject of a paper by Mr. Henri Coens, chief engineer (sub-stations and distribution) of the Brussels Tramways, and Mr. Allard, director of the technical and material supply departments of the National Light Railways of Belgium.

Other papers discussed on the first day were "Tramways and Street Building," by Mr. G. d'Alo, general manager of the Milan Tramways; and "Electric Accumulator-driven Cars in Europe," by Mr. Pierre Lo Balbo, commercial director of the Piedmont Tramways Co., Saluzzo.

In the evening the delegates attended a reception given by the Warsaw Municipal Tramways.

On July 1, at the third and fourth technical sessions, the following papers were considered :—

"Improvements in the construction of rolling-stock on rails and roads," by Dr. Philipp Kremer, manager of Frankfort Tramways and Omnibuses.

"Use of Diesel Motors for Traction on Railways and Roads," by Mr. Henrich Arnold, managing director, Vestischen Kleinbahn G.m.b.H., Herten (Germany).

"Phenomena of Electrolytic Corrosion," by Professor Roman Podoisk, member of the Organisation Committee, Warsaw.

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Centre: The Prime Minister of Poland, Mr. V. Slawek, who presided. On his left is the Minister of Railways, Mr. A. Kuhn; and on his right the President of the International Union, Mr. F. De Lancker.

The Delegates at the Opening Ceremony.

Official Opening of the International Tramway Congress at Warsaw.

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"Comparison of the Various Methods of Transport and Communications—Narrow Gauge Railways, Tramways, Motor Buses and Trolleybuses," by Mr. P. Nestrypke, manager of tramways in Posen.

"Blocking of Line by Automatic Signals on Single Line Sections," by Mr. Otto Lange, manager of the Hälsingborg Tramways.

"The Use of Light Metals in the Construction of Overhead Lines," by Mr. Ladislaus Sekutowicz, Director of Technical Services, "Omnium Lyonnais," Paris.

In the evening the delegates attended a gala performance at the municipal opera house, where they were the guests of the Municipality of Warsaw.

At the fifth and concluding technical session on July 2 two papers were presented, viz.:—

"Evolution of the Electrical Equipment of Rolling Stock," by Mr. Henrich Werner, assistant manager of the Vienna Tramways.

"Means and Methods for Facilitating Passenger Traffic," by Mr. Louis Bacqueyrisse, general manager of works and technical services, Public Transport Co. of Paris.

[Selections from these papers will be given in a later issue.]

In the afternoon of July 2, a general meeting was held, at which it was decided that the next Congress should be held in 1932 at the Hague. In the evening the delegates were received by the President of the Republic, Prof. Ignacy Moscicki, at the Palace.

The following three days were spent in excursions to various parts of Poland. Thursday's excursion included a visit to the famous salt mines at Wieliczka, the climatic station of Zakopane in the Tatra Mountains, the large azote-producing plant at Chorzów, formerly managed by the present President of the Republic, and several coal mines. On the Friday the trip took the delegates over the Galician oilfields, then to the salt mines at Wieliczka, whence to Cracow and Posen. On Saturday several textile plants in Lodz were visited, also the tramway power stations in Warsaw and Lodz, and the new Polish port on the Baltic—Gdynia. At all the places visited the delegates were most hospitably received.

### Opening of Transport Exhibition.

All the delegates except the German contingent, numbering about 20, were present at the opening of the First International Exhibition of Communications at Posen on Sunday morning, July 6. At the opening ceremony the President of the Polish Republic was represented by Mr. A. Kühn, Minister of Railways. After an address by Mr. Ratajski, president of the town of Posen, Baron E. Ropp, managing director of the exhibition, Mr. de Lancker, president of the Congress, declared the exhibition open. The minister and guests then visited the various pavilions. When they arrived at the pavilion containing the exhibits of the Polish Ministry of Railways, 3,000 carrier pigeons from the various countries participating in the exhibition, each bearing a message of greeting from the exhibition, were liberated and started for their various homes. Afterwards a banquet was given to some 800 guests by the exhibition authorities. In the evening Minister Kühn gave a reception at the Palace (formerly the Palace of Wilhelm II of Germany) to the delegates of the Congress and foreign representatives assembled in Posen.

## CHARGES AGAINST MR. H. P. STOKES DISMISSED.

### Failure of a Plymouth Corporation Prosecution.

The magistrates at Plymouth were engaged throughout practically the whole of the first week in July in investigating twenty-one charges of larceny, one of fraudulent conversion and two of falsification of accounts brought against Mr. H. P. Stokes, the former manager and engineer of Plymouth Corporation Tramways and Transport undertaking. The theft charges concerned a variety of articles such as petrol, motor tyres, omnibus doors, glass, wallpaper, etc., and the falsification of accounts allegations related to employment of corporation workmen on work of a private nature.

Mr. G. D. Roberts, for the prosecution, stated that the case grouped itself under the following separate headings: (1) larceny of petrol; (2) larceny of all kinds of articles connected with defendant's private motor car; tyres, spare parts and things of that kind; (3) larceny of articles defendant required for his private residence; (4) larceny of material which defendant required for his seaside bungalow; (5) falsification of the time-sheets and wages sheets of a large number of employees, the result of the falsification being that they were showing as working for the Corporation and were paid by the Corporation, whereas in fact their time and their labour was being expended solely for defendant's benefit; and (6) alleged conversion of £171 worth of tools which were the property of the Corporation.

At the outset defendant's principal counsel, Mr. Comyns Carr, K.C., intimated that it was his intention of resisting the charges most strongly, and he raised a formal objection that the summonses did not disclose the person by whom the information had been laid, and that two of the summonses were irregular and included what might be an unlimited number of offences in each summons.

The first witness called was the city treasurer, Mr. H. J. Hoare, who was submitted to a close cross-examination by defendant's counsel in regard to the method of requisitioning stores, Mr. Comyns Carr seeking to show that no order from defendant was ever referred back on account of irregularity. In one of his replies the city treasurer disclosed that hundreds of thousands of documents had been searched in order to support the charges against the accused.

Evidence was given by a committee clerk regarding the minutes of the Tramways Committee, defendant's counsel drawing the magistrates' attention to one of November 19 which read: "The Committee investigated certain statements as to the management of the tramways department. After interviewing certain members of the staff the Committee was satisfied there was no foundation for those statements." The witness admitted that the resolution which was printed and signed by the chairman of the Tramways Committee was an amended one which read: "Resolved that the Council be informed that in the opinion of this Committee the matter calls for no further action."

The case for the prosecution in regard to alleged thefts of quantities of petrol was that Mr. Stokes used Corporation petrol for his car for his own private use, but the contention of the defence was that the arrangements made were that he should provide the car, pay for the license and insurance and that the department should provide petrol and maintenance.

A Corporation employee who had acted as defendant's driver stated in evidence that those who had any business on the Council connected with the tramways were driven in the car, and he said he supposed he had driven practically every councillor at one time or another.

In addressing the magistrates and submitting that there was no case on which a jury would be likely to convict, Mr. Comyns Carr pointed out that there had been a delay of seven months before Mr. Stokes received an official notification that criminal proceedings were to be taken against him, and that he had not been left a lot of time to prepare his case. Throughout the whole of that time, however, he knew that the matters were being investigated. During the entire period references had appeared in the local press at Plymouth to the possible pendency of proceedings, and whenever these had appeared some person had been in the habit of sending marked copies of the newspapers to every member of Mr. Stokes' board of directors, to several chief constables and to a number of licensing committees before whom he had appeared in the ordinary course of his duties as general manager of the company which he had resigned his position at Plymouth to join.

Without calling any evidence on behalf of the defence the magistrates on Saturday, July 5, the fifth day of the hearing, dismissed all the charges.

The presiding magistrate, Dr. Corbett, said it was common knowledge that many of the perquisites Mr. Stokes was alleged to have succeeded in obtaining for himself were allowed, expressly or tacitly, to the heads of large commercial undertakings. Another matter was that Mr. Stokes made no attempt to make any secret whatever of what he was doing or what was being done on his behalf. The magistrates were satisfied beyond doubt that Mr. Stokes considered he had a right to the upkeep and maintenance of his cars and the service of a Corporation employee as driver, and the criminal charges in relation to those matters therefore failed. He might have been misguided in that assumption, but it should be pointed out that his cars were in constant use for Corporation purposes. With reference to the work done at Kelvin Lodge (the tramways manager's residence) that was Corporation property, and if Mr. Stokes was under any liability in regard to that the magistrates considered such liability was of a civil nature. They could find no evidence in support of the charge of fraudulent conversion, it appearing that the tools and other articles Mr. Stokes was charged with having fraudulently taken were, according to the prosecution's own witness, precisely where they ought to be according to the custom of the trade, namely, in the hands of the manufacturer. With regard to the remaining charges, which were of considerably less gravity, they were satisfied that the evidence did not justify them in committing Mr. Stokes for trial.

The chairman's announcement was greeted with an outburst of applause from the general public.

Mr. Roberts said that although that was a matter which did not concern that Court, he thought he ought to mention that the depositions and the exhibits would probably be laid before the Attorney-General for his consideration.

Mr. Comyns Carr remarked that although there was another application which he might make, he was instructed to make no further application.

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## TRAFFIC CONTROL SIGNALS.

A Device for Tramcars and Trolleybuses.

The Forest City Electric Co., Ltd., 4, Longford Road, Stretford, Manchester, is introducing a new device for traffic control signals operated by electric currents from the trolley wire on tramway or trolley omnibus systems. The two types of signals illustrated below are intended to prevent accidents caused by tramcars or trolley omnibuses making "left" turns, from a main street, or entering a main street from a side street without warning.

Fig. 1 shows the normal aspect of a box signal 24 in. long by 16 in. wide by 12 in. high, with a glass front normally unilluminated. As the vehicle passes under a line contactor the sign is illuminated as in Fig. 2, showing the words "Caution, Tram Turns Left" in red letters against a black ground. The signal is restored to its normal aspect as the vehicle passes under a second line contactor. The warning can be altered to suit circumstances as "Stop! No Room to Pass" or "Car Approaching," etc.

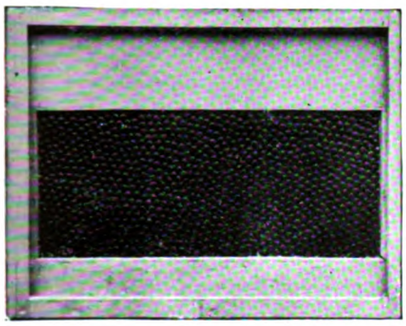

Fig. 1.—Normal Aspect of Box Signal.

Fig. 2.—Illuminated from a Line Contactor.

Fig. 3.—Standard type of Control Signal.

In Fig. 3 is shown the standard type of traffic control signal with the lettering on the sign and lower lenses altered to convey the desired wording. This signal is supplied as illustrated for use at a "left" turn. If used to give warning that a tramcar is approaching from the side street the lettering would be "Stop! Beware of Tram" or other wording.

Both signals are operated by the trolley current, and when clamped to tramway poles the cost of installation is very reasonable.

## MUNICIPAL "OUTSIDE" OMNIBUS POWERS.

On condition that the clauses relating to protection of routes and to special omnibus services outside the borough were struck out, a Select Committee of the House of Lords on July 8 allowed the Stockton-on-Tees Corporation Bill to proceed. The Corporation propose to replace the tramways with motor omnibuses, and by arrangement with Thornaby and Middlesbrough to serve those towns also. Clauses had been included to give protection to the services and to permit the running of omnibuses to places within a limit of thirty miles.

Bury Tramways Committee recently had an interview with representatives of the Commercial Motor Users' Association with respect to omnibuses being used by the Corporation for private tours. The chairman and deputy chairman were subsequently appointed to discuss with the representatives of the Association certain suggestions received and to report to the Committee.

## BRUSH ELECTRICAL ENGINEERING CO.

An Undertaking in which 25 per cent. of the Shareholders are Employees.

Mr. E. Garcke, presided at the forty-first general meeting of the Brush Electrical Engineering Co., Ltd., held in London. In the course of his remarks the chairman said:—The credit on the profit and loss account shows £140,529, compared with £153,857, and after deducting all expenses, which show a reduction on nearly all the items, there is a surplus of £58,988, compared with £67,406. After making the agreed reserve and paying the standard dividend of 10 per cent. for the year on the ordinary stock, the net surplus distributable under the co-partnership scheme is £2,787 for 1929, compared with £11,711 for 1928, and with £10,764 for 1927, £8,835 for 1926 and £8,751 for 1925.

Speaking generally, the business has not undergone any change for the worse. The general condition of the company is satisfactory, and the financial position is strong, our liquid assets, not counting stock of goods and material, being 45 per cent. of our total capital in debentures and ordinary stock. The products of our manufactures continue to enjoy the high reputation of previous years.

### Refusals to take Orders at a Loss.

The reason for the decline in profits is due to the policy based on sound business principles which I have explained on previous occasions—that we decline to do business at a loss. During the year the trend of competition has still further reduced the low price level that prevailed in 1928 and previous years, and we have deliberately declined to take orders which, if we had accepted, would have still further reduced our net profits. The relatively small setback, which I sincerely hope is only temporary if the general conditions of industry in the country can be improved, does not at present hit the stockholders. They receive, if you approve, the same dividend which they have received for many years, but the reduction of the co-partnership surplus from £11,700 to £2,700 is a great disappointment to the employees, especially as the co-partnership surplus has been an increasing one for each year since the inauguration of the co-partnership scheme. About 25 per cent. of the stockholders are employees of the company.

We have demonstrated in this company the considerable benefits that result from a well-thought-out co-partnership scheme. The relations between the management and the works are excellent, by reason of the collaborations that take place from time to time and of mutual interests that have been established. The co-partners have had the benefit, during several years, of seeing the surplus increase. This year they have an adverse experience, but they have taken it in good spirit, and we are working hard, by conjoint efforts, to make good.

### Absurd Trade Union Restrictions.

What I want to say quite generally, and not with any reference to particular undertakings, is that the most serious barriers to successful co-partnership are the rigid Trade Union regulations, which prevent the man who does more, or better than another, from being paid better, and the converse by which a slacker is paid as much as one who does his best. Then there are the absurd restrictions as to output and the resistance to labour-saving machinery. We must all, however, recognise—and sympathise—that the fear of unemployment on the part of men who see the volume of work diminishing is only natural, and this fear of unemployment is going to be a serious obstacle to rationalisation of industry, by reason of the displacement of labour and consequent temporary unemployment that may follow on the adoption of the new policy.

"Rationalisation" broadly is best understood as working and carrying on industry in a rational way. Therefore, if rationalisation means displacement of labour, something must be done to deal rationally with this problem. Why have any unemployment at all? This is a common-sense question which very few seem willing to tackle. Under our present system we are asking for it. Nature is appealing to our senses and our reason to be put to service by men for the welfare of man, and yet man is encouraged to stand by, idly clamouring for employment.

I set my face against general reduction of wages, because I feel convinced there is no remedy that way, but only more trouble. Under present conditions our principles should, I submit, be: (1) Greater economy by elimination of waste; (2) higher efficiency by elimination of inefficient machinery and methods; (3) larger output to neutralise low prices, by removal of trade union restrictions; (4) better relations between all concerned in industry by adoption of well-thought-out schemes of co-partnership appropriate to such industry; and (5) nationally and internationally—that is to say, politically—we must revise our outlook by taking off our personal blinkers.

The report and accounts were unanimously adopted.

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# TRAMWAY AND LIGHT RAILWAY NOTES.

## ATHERTON.

A Trolleybus Substitution.

Lancashire United Transport & Power Co., Ltd., has informed Hindley District Council that, subject to the approval of the Ministry of Transport, it is the company's intention to cease running tramcars on the Atherton to Ashton-in-Makerfield route and to substitute trolleybuses.

## BARNSLEY.

Tramways Abandonment.

On the receipt of a letter from Barnsley Traction Co., asking if the Council objected to the tramways being abandoned at once, Worsborough Council decided to express a hope that the company would provide adequate workmen's services and fares on the omnibuses which they are to run. The clerk reminded the Council that they had no bargaining power with the company, who in two months could discontinue the tramways. They were now merely a competitive omnibus company. When the Bill was drafted there was a clause giving a semi-monopoly, but owing to the opposition of Barnsley and the West Riding, this clause was discarded. The company then merely sought powers to abandon.

## BELFAST.

Holiday Facilities for Children.

Mr. W. Chamberlain, general manager of Belfast Corporation Tramways and Omnibuses, proposes that school children be permitted during the holidays to travel between the city centre and any point for a half-penny, with the objecting of getting them into the country and the public parks. Saturdays and Sundays are excepted. Three separate actions were brought against Belfast Corporation for injuries sustained while alighting from or boarding a tramcar. All three failed, the Recorder holding that the accidents were due in each case to the plaintiff's negligence.

## BIRMINGHAM.

Accidents at Tramway Stops.

Reporting on the increase in street accidents, Sir Charles Rafter, chief constable of Birmingham, advocates the provision of further refuges at suitable places. He reports that from January, 1926, to December, 1929, 260 non-fatal accidents were caused by vehicles while the public were crossing the carriageway to board tramcars, or after alighting from them, and in 1929 seven fatal accidents were thus caused. For several years, he says, he has been advocating the necessity of bringing tramcars to the footpath, where opportunity offers.

## BLACKBURN.

Delegates to Harrogate Conference.

When the Tramways Committee made a recommendation to the Blackburn Town Council that the chairman, vice-chairman and tramways manager should attend the annual conference of the Municipal Tramways and Transport Association at Harrogate in September, Councillor Culshaw moved the reference back on the ground of economy and that one man was sufficient. Mr. Cuishaw was the only member who voted for the reference back.

## BURNLEY.

Holiday Fares for Children.

The Tramways Committee has decided to allow children attending elementary schools to travel during the school holidays to various parks at reduced fares. The fares will be ½d. for any distance for which the ordinary fare is not more than 2d. and 1d. for any distance for which the ordinary fare is more than 2d.

## DERBY.

The Transport Problem.

At a meeting of Derby Watch and Estates Committees, expert witnesses gave evidence in regard to Derby's traffic problem. Mr. W. P. Bancroft (tramways manager) detailed various suggestions which had been made for speeding-up the services by the substitution of omnibuses, either trolley or petrol, for tramways. He pointed out that traffic congestion was serious, and alluded to the advantages of using a vehicle that could draw up to the kerb. Another conference will be held, when the chief constable and other officials are expected to give evidence.

## EDINBURGH.

Proposed Universal Fare.

At a meeting of the Public Utilities Committee of Edinburgh Town Council on June 27, a report was submitted by the city chamberlain and the transport manager on the proposal to establish a universal fare of 1½d. on the tramways and omnibuses. It points out that the present fares are sufficient to meet the expenses and leave a small surplus. Having regard to the facilities provided, passengers in Edinburgh pay fares which compared favourably with those charged elsewhere. The report concludes by stating that the question is a matter of policy and must be determined by the committee.

## EXETER.

Tramways *versus* Omnibuses.

Following a discussion by the City Council on the relative merits of tramways and omnibuses, Mr. T. Hooper, chairman of the Transport Committee, said that they hoped to present to the next meeting a full report on the two methods.

## GLASGOW.

Speedometers for Tramcars Suggested.

Following an inquiry into the death of two men who were killed in a tramcar accident at Glasgow, the jury recommended that speedometers should be fitted on all tramcars and that precautions should be taken to enforce the regulations regarding stopping places.

## LEEDS.

Brave Tramway Conductor.

Mr. Henry Maynard, a Leeds tramway conductor, has been congratulated by the Tramways Committee on his heroism in jumping from the platform of his car to stop a runaway horse. As the horse drew level with the car, the conductor jumped from the platform and seized the bridle. He was dragged a 100 yards before he succeeded in stopping the horse.

## LONDON.

New Tramcars for North London—Leyton Approves L.C.C. Agreement—M.O's Court Fees Increased—Street Widenings—Fined for Threatening a Conductor—Passes for Walthamstow Pensioners—Damages against East Ham Corporation.

At a meeting of Middlesex County Council on June 26, Mr. W. B. Pinching, chairman of the Light Railways and Tramways Sub-Committee, in reply to complaints of the tramway services to Alexandra Palace, said that his committee had just approved the construction of 54 new tramcars, which would be in commission before Christmas, and would greatly improve the service of Metropolitan Electric Tramways, Ltd. The double-deck cars now in use were too high to pass under certain bridges, but the company was reducing the height by two inches. Leyton Council has approved the supplemental agreement with the London County Council relating to the working of the Leyton tramways, which includes the provision by Leyton of fifty new cars. The fee of the three medical advisers retained by the L.C.C. in connection with tramway claims, is to be increased from £2 2s. to £2 12s. 6d. for each attendance at Court for the purpose of giving evidence. Widenings are to be made in Baring Road, between St. Mildred's Road and Grove Park station, at a cost of £27,300, and the Highways Committee has agreed to the allocation of one-third of the total to the tramway account. The tramway works will be put in hand as soon as the necessary property has been acquired. A seaman on an L.C.C. tramcar who was asked not to smoke threatened the conductor and drew a dagger. At the West London Court he was fined 7s. 6d. for threatening and insulting behaviour. Walthamstow Council has decided to grant free travelling facilities on the council's tramcars to old-age pensioners between 9.30 a.m. and 4.30 p.m., and after 7 p.m. on Mondays and Fridays. In Bow County Court on June 23 Mrs. A. Hoadley, a hawker, was awarded £225 damages, besides costs, against East Ham Corporation for personal injuries and loss of business caused by a tramcar. Her pony and cart were turning into Barking Road when the tramcar hit the cart, in which she was riding, and she was thrown out.

## MANCHESTER.

Employees' Holidays.

The total number of employees of the Manchester Corporation Transport Department at March 31, 1930, was 7,985. Of these 4,338 were engaged in the traffic department. Some time ago the City Council granted twelve days' holiday with pay to all employees, involving the granting of an additional four days to the majority of the men in the service. The estimated cost of the concession is £10,300 per annum. During the year a five-night week was adopted for approximately 680 shed workers. The same weekly hours were worked in the five nights as were worked in the six, the resulting output of work remaining unchanged. This system, the Committee state, is working satisfactorily.

## MIDDLESBROUGH.

Future of the Tramways.

The Tramways Committee of Middlesbrough Corporation is preparing a report on the means of transport to be adopted when Stockton's period of running the tramways ends.

## NOTTINGHAM.

Improving the Tramcars—Trolleybus Success.

The Corporation Transport Department is substituting upholstered transverse seats on the lower deck of their tramcars, and rubber flooring is to be used. Mr. W. G. Marks (general manager) states that the success of the trolleybus service between Wells Road and Wilford Bridge is well established.

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### OLDHAM.

INCREASE IN FARES.

The Town Council has decided to abolish 1d. fares and to introduce a 1½d. minimum fare on the tramcars and omnibuses. It was also decided to adopt return tickets between 10 a.m. and 5 p.m., twopenny stages to be threepence and other stages in proportion. During the past year there was a net loss of £15,000 on the transport undertaking, a profit on the tramways of £5,000, but a loss on the omnibuses of £20,000.

### PORTSMOUTH.

NEW ADMINISTRATIVE OFFICES.

Portsmouth City Council has approved plans submitted by the Tramways Committee for new administrative offices at Eastney, at an estimated cost of £21,000.

### ROTHESAY.

TRAMWAY COMPANY PROVIDES SUNDAY CONCERTS.

The Tramways Company is providing sacred concerts at Elthick Bay on Sunday afternoons free to the public. The music is by radio-gramophone with loud-speakers. The town council recently passed a resolution protesting against these concerts.

### SALFORD.

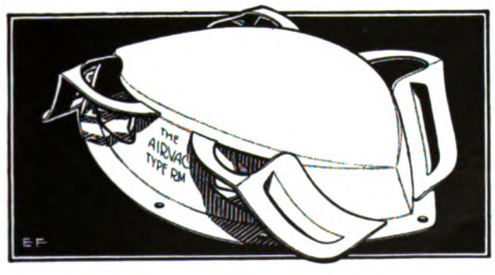
INQUEST AND INQUIRY ON OVERTURNED CAR FATALITY.

At an inquest on June 18 on the woman who was killed when a Salford Corporation tramcar jumped the metals and overturned, the jury returned a vertict of "Accidental death." The foreman added: "We find it a pure accident owing to the car jumping the points." The Coroner said the easiest explanation was that the car was diverted in the direction of the loop line and that the point did not lift, so that the car had to proceed in that direction. There was a difference of opinion regarding the speed of the car. Mr. Moffet, general manager of Salford Transport, said that the cross-over was constructed about 1907 with the approval of the Ministry. He agreed that all facing points had to be watched very carefully. The Ministry of Transport inquiry into the same accident was held on June 20. Evidence by several witnesses favoured the theory that the accident was caused by a bolt, which had probably fallen from a passing vehicle, lying on the points. Mr. Moffet said that the effect of a bolt in the points was to make a car rise and go on one side; the tyre of the wheel bore marks consistent with the theory of a bolt having lain on the track. Lieut.-Colonel Anderson, who conducted the inquiry, said he would give his decision after compiling a report for the Ministry.

### SOUTHPORT.

FUTURE TRANSPORT POLICY—SMALL TRAMWAYS DEBT—SAFETY FIRST DIPLOMAS.

At a meeting of the Town Council, Councillor Billington, chairman of the Tramways Committee, said that the committee were considering the whole question of transport, and he intended to give a full report of the committee's policy with regard to both tramcars and omnibuses. In reply to Councillor Hibbott, who advocated abolition of the tramcars from Monument Square, London Street, and part of Lord Street, Councillor Billington said they would not be satisfied until they had got the tramcars off Lord Street. In his annual report to the Tramways Committee, Mr. T. J. Kendrew (general manager) states that the capital expenditure has been paid off with the exception of £37,256, and there is £28,067 in the renewals fund and £4,961 in the appropriation account. Therefore, any change in the methods of transport which may be adopted will not have to bear any great debt that belonged to the tramways. Eighty out of eighty-nine drivers of the Corporation tramcars and omnibuses qualified for the diploma of the National Safety First Association during the year ended March 31 last.

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### SCARBOROUGH.

PURCHASE SCHEME FAILS.

Mr. T. Hornsby, of United Automobile Services, tried to obtain an extension of his option to purchase the Scarborough tramways which expired on June 30, when the Council proposed to purchase the undertaking, while the United Automobile Services would operate all the transport services. Mr. Hornsby was unable to get his option extended, however, and the scheme has fallen through.

### SHEFFIELD.

MUNICIPAL PRINTING OF TICKETS.

The "Sheffield Independent" states that Mr. Percival Sharp, hon. controller of the municipal printing department of Sheffield, has stated that he is making preparations for the printing of tramway and omnibus tickets. The printing department is a new municipal enterprise, which was formally opened by Earl Russell.

### TYNEMOUTH.

PROPOSED ABANDONMENT OF TRAMWAYS.

Tynemouth Corporation has appointed a sub-committee to co-operate with the Watch Sub-Committee in dealing with negotiations which are taking place with the Tynemouth and District Traction Co., in connection with the suggested abandonment of the tramways within the borough, with special reference to the reinstatement of roads.

### WIGAN.

COMING REPORT ON TRANSPORT POLICY.

Alderman Santus, chairman of Wigan Tramways Committee, announced at a meeting of the council that a comprehensive report on the town's transport is being prepared, and when it is completed the committee hope to present a definite policy for the new transport system. Local reports show that the corporation is negotiating with local authorities in the district to obtain support for proposals to operate trolleybuses.

### WOLVERHAMPTON.

GERMANS INSPECT TROLLEYBUS SYSTEM.

The trolleybus system was inspected by another deputation from Germany on June 23. The visitors included Herr G. G. Kemmann (consulting engineer, Berlin), Dr. Bracht (Mayor of Essen), and Herr W. Kern (general manager, Essen tramways). They were received by the Mayor (Councillor Alan Davies), who is chairman of the Transport Committee, and Mr. C. Owen Silvers (transport manager), and made a journey on one of the omnibuses. Two other deputations from the Continent who lately inspected the system returned highly gratified with its working, and it is probable that the system will be introduced in several German towns.

## PERSONAL.

**Mr. D. Johnstone Sinclair** has joined the boards of the International Automatic Telephone and the Automatic Telephone Manufacturing Companies.

**Mr. C. R. Bellamy,** general manager of the Hong Kong Tramways, Ltd., is in this country on short leave. He expects to return to Hong Kong in November.

**Mr. Frank D. Newbury,** manager of the Power Engineering Department, Westinghouse Electric and Manufacturing Co., East Pittsburgh, U.S.A., is at present on a visit to Europe.

**Mr. A. P. Fitzmaurice,** who was on the engineering staff of the British Electric Traction Co., Ltd., has retired owing to reorganisation in the engineering staff. Mr. Fitzmaurice joined the company in 1905.

**Mr. C. F. C. Gifford,** engineer-salesman of the Associated Equipment Co., has left for South Africa, where he will represent the company from the Griffin Engineering Co., Ltd., Griffin Building, 43, Anderson Street, Johannesburg.

**Mr. Francis Hodgkinson,** consulting mechanical engineer, Westinghouse Electric and Manufacturing Co., is visiting Europe. He joined the Westinghouse Company in 1896, having previously spent several years with C. A. Parsons and Co., Ltd.

**Sir Alexander Roger,** formerly vice-chairman of British Insulated Cables, Ltd., has been appointed chairman of the company in succession to the late Mr. Dane Sinclair. Mr. John Ferguson, a director of the company, has been appointed vice-chairman.

**Mr. F. V. L. Mathias,** borough electrical engineer of Warrington, and Mrs. Mathias have been presented with a clock on the occasion of their silver wedding, the gift being from the staff and employees. Mr. Mathias is also electrical engineer to the tramways undertaking.

**Mr. George Potter,** a tramcar conductor of Derby Corporation, has been presented with a framed certificate and a cheque for £10 from the Carnegie Hero Trust in recognition of his heroic efforts to save life in stopping a runaway horse on January 15. He was seriously injured.

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**Sir Hugh Turnbull,** Commissioner of the City of London Police, proposes to pay a seven-weeks' visit to America in the autumn. He will attend a traffic conference at Washington and will also examine the traffic methods of the principal police forces in the United States.

**Mr. Mackenzie L. Hill,** a Nottingham Corporation tramway motorman, has been appointed a licentiate of the Royal Academy of Music. Mr. Hill recently passed successfully an examination of the Academy; he is a member of the newly-formed Corporation Transport Orchestra.

**Mr. C. E. Vance,** owing to the sale of various enterprises and the reorganisation of the engineering staff of the British Electric Traction Co., Ltd., has retired. Mr. Vance joined the B.E.T. in 1900 and had been assistant to Mr. C. W. G. Little, who retired in December last, during the greater part of that period.

**Mr. G. J. Rackham,** chief engineer of the Associated Equipment Co., has left for a visit to Canada and America. His object is to study the latest trends in design and automotive practices. Mr. Rackham will call on omnibus operators and commercial vehicle manufacturers in Montreal, Toronto, Detroit, Chicago, and New York.

**Mr. John Wilson,** the new traffic and transport manager of the Buenos Ayres Western Railway, had held the position of chief electrical engineer. He is succeeded in that post by **Mr. Ratcliffe Wright,** who was formerly with power supply companies in the North-east of England. In 1915 he was appointed to the Buenos Ayres Western Railway for the electrification of suburban lines, and in 1923 he became chief assistant to the electrical engineer.

**Mr. G. B. Milford,** manager of the Johannesburg tramways, has on the recommendation of the General Purposes Committee, and confirmed by the City Council, been retired as from May 31 owing to a pending reorganisation of the department. There was a keen debate in the Council on the treatment of Mr. Milford, who was paid six months' salary in lieu of notice, and it is also understood that he will receive a pension of about £60 per month.

**Sir George Touche, Bt.,** at the meeting of the Anglo-Argentine Tramways on July 1, announced his retirement from the chair. He said that when his colleagues asked him to become chairman on the death of Mr. Concanon, he had already been advised to restrict his business activities on account of his health, and had stipulated that it should be for a limited period only. He had delayed his resignation while the fate of the ad-referendum agreement of 1925 was in suspense. That phase was now ended, and a new chapter was beginning which should be one of great development. He was glad to announce that the Duke of Athol had consented to become chairman.

**Mr. T. Peirson Frank** has been appointed by the London County Council, chief engineer, county surveyor, and administrator of housing development schemes at a commencing salary of £3,000 a year. Mr. Frank has been city engineer at Liverpool for the past four years. Born in Huddersfield 44 years ago, he has held appointments in his native town and at Dewsbury, Ripon, Newark, Stockton-on-Tees, Plymouth and Cardiff. At Liverpool he has carried out several development schemes, and been responsible for new arterial roads and main bridges. He is also an experienced lecturer on civil engineering subjects. He succeeds Sir George Humphreys, who will retire in November. The recommendation was adopted at the Council's meeting on July 8, when Mr. W. H. Webbe, vice-chairman of the General Purposes Committee, stated that at no time had the Council been faced with so many engineering problems as was likely to be the case within the next few years.

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In memory of the late **Mr. J. M. Strachan,** head of Strachan's (Acton), Ltd., London, W., two stained glass windows have been erected in the parish church of Cookney, Kincardine, his birthplace. Mr. Strachan, after working as a joiner in Scotland, settled in London, in the coachbuilding trade, and found an outlet for his inventive genius in various patents connected with coachwork. Ultimately he started in business for himself, and at the time of his death he was head of an undertaking that employed 600 workers in the building of bodies for omnibuses. Mr. Strachan figured largely in public life, and was a councillor on Kensington Borough Council. He gave a large sum of money for the building of a parish hall at Cookney and was distinguished by many other generous acts.

## NEW TRAMCARS FOR NORTH LONDON.

At a meeting of Middlesex County Council on June 26, Mr. W. B. Pinching, chairman of the Light Railways and Tramways Sub-Committee, in reply to complaints of the tramway services to Alexandra Palace, said that his committee had just approved the construction of 54 new tramcars, which would be in commission before Christmas and would greatly improve the service of Metropolitan Electric Tramways, Ltd.

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## CONTRACTS AND ORDERS.

**Salford Corporation** has accepted the tender of Hadfields, Ltd., for the supply of a double tramway junction.

**Edgar Allen & Co., Ltd.,** were the successful tenderers to Leeds Tramways Committee for the supply of lay-outs and points.

**British Thomson-Houston Co., Ltd.,** is supplying gas-filled and vacuum lamps to the Office of Works during the period ending May 31, 1931.

**Ferguson, Pailin, Ltd.,** are to supply and erect a switchboard at the station of Southport Corporation. The amount of the contract is £18,215.

**Splintex Safety Glass, Ltd.,** have received a contract from Sociedad Espanola de Construccions Naval, Spain, for Splintex for the control platforms of cruisers.

**Siemens Electric Lamps & Supplies, Ltd.,** have a further contract with H.M. Office of Works for 50,000 vacuum and gas-filled lamps over a period of twelve months.

**East Ham Corporation Tramways Committee** has recommended the acceptance of the tender of Allen Liversedge, Ltd., for the supply of a welding grinding machine.

**Sydney (N.S.W.) City Council** have accepted the tender of Johnson and Phillips, Ltd., for heavy power cable. The amount of the contract is approximately £30,000.

**Siemens Electric Lamps and Supplies, Ltd.,** have received a further contract from the Royal Mail Steam Packet Co., for a twelve months' supply of Siemens electric lamps.

**Maley & Taunton, Ltd.,** of Wednesbury, have received a contract from Edinburgh Corporation Tramways for 25 sets of the Maley-Taunton new system air and magnetic brakes.

**Birmingham Corporation** has placed an order with the Equipment and Engineering Co., Ltd., for another No. 2 rail-grinding machine. This is the second order placed for this type of machine.

**Glasgow Transport Committee** has accepted the tenders of S. Osborn & Co., Ltd., for semi-elliptic car springs, Thomas Bolton and Sons, Ltd., for copper bonds, and P. & W. McLellan, Ltd., for square black nuts.

**Leeds Corporation** has accepted the following tenders for tramcar equipments :—General Electric Co., Ltd., fifty electrical equipments at £590 per set ; British Thomson-Houston Co., Ltd., fifty electrical equipments at £590 per set.

**Portsmouth Corporation** received the following tenders for automatic traffic signals, the first being accepted : Forest City Electric Co., £140 ; Barber and Coleman, £144 ; Equipment and Engineering Co., £152 10s. ; Siemens and General Electric Railway Signal Co., £159 16s. 9d.

**Halifax Tramways Committee** has accepted the following tenders : Richard Johnson & Nephew, five miles copper trolley wire ; J. Steel and Sons, tramcar springs ; Record Oil and Grease Co., 6,000 gallons lubricating and 11,000 gallons motor oil ; Spermolin, Ltd., 10,000 gallons motor oil.

**New Tramcars for Leeds.**—The Leeds City Council , on the recommendation of the Tramways Committee, have just placed an order with the Brush Electrical Engineering Co., Ltd., Loughborough, for 100 double-deck, top-covered tramcars, of the latest up-to-date design, to be mounted on " Peckham " type flexible axle trucks. The amount of the contract is about £165,000.

**The M.C.L.** lighting and starting equipment has again been specified by the India Office on the majority of this year's tenders for commercial vehicles. Considering the strenuous work and high temperatures which vehicles have to withstand in India, it proves that the M.C.L. equipment is extremely robust and efficient. The M.C.L. and Repetition Co. have also recently received orders from Dennis Bros., Ltd., for their new " Dart," " Arrow," and " Lance " chassis, which are largely used for omnibus work.

**Airvac Ventilators,** of Honeypot Works, Darlington, have received a sixth repeat order for 108 Airvac ventilators, type R, from the Bombay, Baroda and Central India Railway. During the past month orders have been received from the Iraq Railways for 60 Airvac ventilators and 40 interior fittings, 28 type RM airvacs for locomotive cab roofs for the Benguela Railway, and type R airvacs for the North Western Railway of India, Sudan Government Railways, and the Entre Rios Railway, in the latter case for equipping an articulated steam rail car.

**The English Electric Co.** has received an important contract from the Central Electricity Board for transformers for the Mid-East England scheme. The contract is for 16 units totalling 130,000 kVA., and comprises the following : Six 10,000 kVA. 66 kV. transformers, two each for Kirkstall, Harrogate, and York ; two 10,000 kVA. 22 kV. transformers for Huddersfield ; four 7,500 kVA. 33 kV. units, two each for Peterborough and Barnsley ; four 5,000 kVA. 33 kV. transformers for Rotherham and Doncaster. Each unit will be complete with the English Electric on-load tap changing gear.

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# TRAFFIC RETURNS.

## Tramway and Omnibus Undertakings in the United Kingdom.

| NAME OF COMPANY OR CORPORATION | 1929. WEEKS ENDING June 15 | June 22 | June 29 | July 6 | ... | 1930. WEEKS ENDING June 14 | June 21 | June 28 | July 5 | ... | AGGREGATE. Wks. | 1930 | Increase or Decrease |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Aberdeen Corporation ... ... ... | 5,087 | 4,965 | 5,461 | 5,061 | ... | 5,498 | 5,404 | 5,244 | 5,683 | ... | 5½ | 30,258 | + 1,661 |
| Ashton-under-Lyne Corporation ... ... | 1,686 | 1,669 | 1,705 | 1,696 | ... | 1,800 | 1,523 | 1,560 | 1,602 | ... | 14 | 22,725 | — 1,040 |
| Ayr Corporation ... ... ... | 570 | 555 | 588 | 679 | ... | 548 | 564 | 561 | 614 | ... | 7 | 4,070 | — 259 |
| Barrow Corporation ... ... ... | 970 | 920 | 1,007 | 1,084 | ... | 1,196 | 1,078 | 1,008 | 1,129 | ... | 14 | 13,657 | + 578 |
| Belfast City ... ... ... ... | 12,555 | 12,014 | 12,415 | 12,209 | ... | 13,094 | 13,462 | 12,969 | 13,034 | ... | 13½ | 177,510 | + 11,040 |
| Birkenhead Corporation ... ... ... | 4,933 | 5,016 | 5,165 | 5,315 | ... | 6,095 | 5,115 | 5,250 | 5,601 | ... | 14 | 71,929 | + 2,503 |
| Birmingham Corporation ... ... | 41,698 | 41,075 | 41,459 | 41,481 | ... | 42,807 | 42,162 | 43,172 | 43,313 | ... | 14 | 605,396 | + 35,858 |
| Blackburn Corporation ... ... ... | 1,930 | 1,950 | 1,915 | 2,066 | ... | 2,471 | 2,129 | 2,106 | 2,225 | ... | 13½ | 29,219 | + 2,880 |
| Bradford Corporation ... ... ... | 15,787 | 14,830 | 14,869 | 15,277 | ... | 15,386 | 14,436 | 14,697 | 15,613 | ... | 14 | 198,626 | — 9,554 |
| Brighton Corporation ... ... ... | 2,624 | 2,707 | 3,028 | 2,761 | ... | 3,032 | 2,743 | 3,241 | 3,148 | ... | 13½ | 36,660 | + 2,205 |
| Burnley Corporation ... ... ... | 3,652 | 3,471 | 3,589 | 3,514 | ... | 3,813 | 3,282 | 3,353 | 3,771 | ... | ... | ... | ... |
| Burton-on-Trent Corporation ... ... | 793 | 766 | 766 | 797 | ... | 880 | 903 | 801 | 835 | ... | 14 | 11,838 | + 823 |
| Bury Corporation ... ... ... ... | 2,404 | 2,382 | 2,415 | 2,406 | ... | 3,186 | 2,852 | 2,875 | 2,982 | ... | 13½ | 40,889 | + 6,051 |
| Cardiff Corporation ... ... ... | 7,700 | 7,594 | 7,799 | 7,801 | ... | 8,853 | 7,668 | 8,002 | 7,892 | ... | 13½ | 107,708 | + 2,822 |
| Chatham and District ... ... ... | 1,165 | 1,201 | 1,272 | 1,208 | ... | 1,367 | 1,185 | 1,241 | 1,359 | ... | 26 | 29,114 | + 1,373 |
| Chesterfield Corporation ... ... .. | 1,830 | 1,900 | 1,821 | 1,842 | ... | 1,940 | 1,885 | 1,831 | 1,892 | ... | 14 | 26,072 | + 1,057 |
| Colchester Corporation ... ... ... | 530 | 536 | 559 | 582 | ... | 593 | 626 | 653 | 714 | ... | 15 | 8,753 | + 1,017 |
| Colne Corporation ... ... ... | 703 | 678 | 726 | 705 | ... | 690 | 713 | 697 | 699 | ... | 14 | 10,238 | + 61 |
| Coventry Corporation ... ... ... | 3,574 | 3,627 | 4,019 | 3,706 | ... | 4,298 | 3,576 | 3,932 | 3,707 | ... | 14 | 54,342 | + 1,949 |
| Darlington Corporation ... ... ... | 981 | 950 | 962 | 1,002 | ... | 1,069 | 1,030 | 1,030 | 1,288 | ... | 13½ | 14,716 | + 1,393 |
| Derby Corporation ... ... ... | 3,206 | 3,193 | 3,259 | 3,253 | ... | 3,744 | 3,291 | 3,321 | 3,451 | ... | 14 | 46,844 | + 2,944 |
| Dover Corporation ... ... ... | 396 | 403 | 424 | 419 | ... | 449 | 419 | 438 | 476 | ... | 14 | 5,495 | + 241 |
| Dundee City ... ... ... ... | 3,541 | 3,423 | 3,405 | ... | ... | 3,641 | 3,887 | 3,685 | ... | ... | 6½ | 24,483 | + 514 |
| East Ham Corporation ... ... ... | 2,304 | 2,287 | 2,309 | 2,306 | ... | 2,413 | 2,293 | 2,319 | 2,379 | ... | 13½ | 32,002 | + 768 |
| Edinburgh Corporation ... ... ... | 17,848 | 17,897 | 18,796 | 22,139 | ... | 19,371 | 19,597 | 19,206 | 23,542 | ... | 7½ | 146,948 | + 5,205 |
| Exeter Corporation ... ... ... | 840 | 856 | 879 | 892 | ... | 927 | 863 | 833 | 855 | ... | 14 | 11,131 | — 514 |
| Glasgow Corporation ... ... ... | 50,999 | 49,624 | 51,410 | ... | ... | 54,849 | 54,695 | 53,915 | ... | ... | 4 | 218,628 | + 16,675 |
| Gloucester Corporation ... ... ... | 557 | 542 | 549 | 549 | ... | 832 | 703 | 684 | 723 | ... | 13½ | 9,341 | + 2,107 |
| Grimsby Corporation ... ... ... | 1,363 | 1,358 | 1,362 | 1,388 | ... | 1,719 | 1,556 | 1,516 | 1,718 | ... | 14 | 21,160 | + 2,730 |
| Halifax Corporation ... ... ... | 4,475 | 4,498 | 4,469 | 4,396 | ... | 5,206 | 5,215 | 5,286 | 5,277 | ... | 14½ | 73,958 | + 9,003 |
| Huddersfield Corporation ... ... | 6,421 | 6,296 | 6,341 | 6,277 | ... | 7,362 | 6,275 | 6,367 | 6,625 | ... | 14 | 89,294 | + 1,270 |
| Hull Corporation ... ... ... ... | 7,205 | 7,144 | 6,994 | 7,092 | ... | 7,540 | 7,231 | 7,051 | 7,385 | ... | 14 | 100,336 | + 1,305 |
| Ilford Corporation ... ... ... ... | 1,614 | 1,599 | 1,631 | 1,499 | ... | 1,609 | 1,542 | 1,572 | 1,609 | ... | 13½ | 21,169 | + 434 |
| Ipswich Corporation Trolley Buses ... | 1,256 | 1,242 | 1,278 | 1,363 | ... | 1,431 | 1,316 | 1,490 | 1,392 | ... | 13½ | 18,327 | + 1,155 |
| Isle of Thanet ... ... ... ... | 869 | 1,034 | 1,220 | 1,289 | ... | 1,172 | 1,006 | 1,201 | 1,273 | ... | 26½ | 14,280 | — 491 |
| Kilmarnock Corporation ... ... ... | 466 | 465 | 465 | 461 | ... | 496 | 525 | 500 | 489 | ... | 7½ | 3,635 | + 155 |
| Leeds Corporation ... ... ... ... | 20,224 | 19,580 | 20,274 | 19,607 | ... | 21,884 | 20,411 | 20,522 | 21,399 | ... | 13½ | 278,916 | + 9,020 |
| Leicester Corporation ... ... ... | 8,711 | 8,350 | 8,449 | 8,587 | ... | 8,740 | 8,349 | 8,371 | 8,617 | ... | 14 | 116,720 | + 1,812 |
| Lincoln Corporation Buses ... ... | 924 | 931 | 909 | ... | ... | 1,048 | 897 | 895 | ... | ... | 13 | 11,958 | + 52 |
| Liverpool Corporation ... ... ... | 30,284 | 29,921 | 30,471 | 30,667 | ... | 31,882 | 30,320 | 30,439 | 31,595 | ... | 13½ | 417,593 | + 5,963 |
| London County Council ... ... ... | 84,200 | 83,580 | 83,666 | 82,861 | ... | 87,151 | 82,641 | 82,261 | 84,298 | ... | 13½ | 1,110,771 | — 2,332 |
| Luton Corporation ... ... ... | 459 | 459 | 409 | 402 | ... | 477 | 441 | 429 | 445 | ... | 13½ | 5,501 | + 317 |
| Maidstone Corporation ... ... ... | 790 | 796 | 768 | 951 | ... | 937 | 824 | 881 | 1,047 | ... | 13½ | 12,294 | + 973 |
| Manchester Corporation ... ... ... | 40,898 | 40,793 | 41,330 | 41,480 | ... | 40,575 | 41,274 | 41,977 | 43,076 | ... | 14 | 566,383 | + 10,649 |
| Middlesbrough Corporation ... ... | 1,632 | 1,597 | 1,624 | 1,616 | ... | 1,626 | 1,556 | 1,701 | 1,734 | ... | 14½ | 23,220 | + 112 |
| Newcastle-on-Tyne Corporation ... | 12,226 | 12,132 | 16,673 | 11,747 | ... | 11,845 | 11,602 | 16,407 | 11,733 | ... | 13½ | 161,926 | — 4,267 |
| Newport Corporation ... ... ... | 2,440 | 2,376 | 2,444 | 2,474 | ... | 2,602 | 2,335 | 2,323 | 2,423 | ... | 14 | 33,645 | + 317 |
| Nottingham Corporation ... ... ... | 9,405 | 9,427 | 9,416 | 9,656 | ... | 10,844 | 10,397 | 10,536 | 10,823 | ... | 14½ | 150,001 | + 12,919 |
| Northampton Corporation ... ... | 1,739 | 1,740 | 1,832 | 1,728 | ... | 2,020 | 1,775 | 1,773 | 1,773 | ... | 13½ | 25,011 | + 969 |
| Oldham Corporation ... ... ... | 5,558 | 5,457 | 5,668 | 5,632 | ... | 5,692 | 5,180 | 5,048 | 5,433 | ... | 15 | 80,378 | — 3,760 |
| Plymouth Corporation ... ... ... | 5,447 | 5,566 | 5,613 | 5,790 | ... | 6,270 | 6,051 | 6,102 | 6,261 | ... | 13½ | 82,789 | + 6,344 |
| Portsmouth Corporation ... ... ... | 6,279 | 6,399 | 6,722 | 6,694 | ... | 8,770 | 7,296 | 7,453 | 8,539 | ... | 14 | 98,633 | + 14,376 |
| Preston Corporation ... ... ... | 2,154 | 2,168 | 2,198 | 2,255 | ... | 2,509 | 2,093 | 2,127 | 2,172 | ... | 13½ | 29,039 | — 566 |
| Rawtenstall Corporation ... ... ... | 1,422 | 1,384 | 1,434 | 1,412 | ... | 1,372 | 1,377 | 1,291 | 1,332 | ... | 13½ | 19,131 | — 371 |
| Reading Corporation ... ... ... | 2,432 | 2,446 | 2,475 | 2,446 | ... | 3,182 | 2,418 | 2,467 | 2,531 | ... | 14 | 33,401 | + 1,101 |
| Rochdale Corporation ... ... ... | 4,548 | 4,429 | 4,548 | 4,638 | ... | 4,837 | 4,276 | 4,143 | 4,400 | ... | ... | 60,447 | — 2,581 |
| Rotherham Corporation ... ... ... | 2,557 | 2,534 | 2,649 | 2,600 | ... | 2,942 | 2,510 | 2,722 | 2,673 | ... | 14 | 38,954 | + 2,010 |
| Salford Corporation ... ... ... | 10,973 | 11,476 | 11,252 | 11,298 | ... | 11,969 | 11,014 | 11,543 | 11,917 | ... | 13½ | 158,559 | + 3,372 |
| Sheffield Corporation ... ... ... | 21,035 | 20,910 | 20,830 | 21,029 | ... | 21,822 | 20,183 | 20,010 | 20,914 | ... | 13½ | 290,387 | — 1,173 |
| Southampton Corporation ... ... | 4,163 | 4,265 | 4,205 | 4,177 | ... | 4,883 | 4,381 | 4,176 | 4,898 | ... | 14 | 57,709 | + 3,211 |
| Southport Corporation ... ... ... | 1,666 | 1,688 | 1,759 | 1,915 | ... | 2,271 | 1,828 | 1,770 | 1,960 | ... | 13½ | 23,908 | + 611 |
| Southend-on-Sea Corporation ... ... | 2,437 | 2,533 | 2,510 | 2,676 | ... | 2,539 | 2,566 | 2,727 | 2,956 | ... | 14½ | 34,140 | + 1,202 |
| St. Helens Corporation ... ... ... | 1,868 | 1,890 | 1,867 | 1,979 | ... | 2,393 | 2,024 | 1,938 | 2,021 | ... | 13½ | 26,803 | + 1,958 |
| Sunderland Corporation ... ... .. | 2,682 | 2,612 | 2,798 | 2,759 | ... | 3,118 | 3,148 | 3,246 | 3,445 | ... | 14 | 42,574 | + 7,142 |
| Swindon Corporation ... ... ... | 732 | 734 | 749 | 604 | ... | 1,248 | 1,023 | 963 | 1,009 | ... | 13½ | 13,191 | + 3,587 |
| Wallasey Corporation ... ... ... | 3,576 | 3,430 | 3,624 | 3,667 | ... | 4,717 | 3,816 | 3,729 | 4,145 | ... | 13½ | 49,374 | + 2,959 |
| Walsall Corporation ... ... ... | 3,253 | 3,201 | 3,198 | 3,265 | ... | 4,168 | 3,215 | 3,305 | 3,263 | ... | 14 | 49,029 | + 1,754 |
| Walthamstow Corporation ... ... | 2,518 | 2,498 | 2,567 | 2,448 | ... | 2,887 | 2,572 | 2,502 | 2,613 | ... | 13½ | 34,522 | + 280 |
| Warrington Corporation ... ... ... | 1,332 | 1,298 | 1,441 | 1,326 | ... | 1,444 | 1,343 | 1,343 | 1,581 | ... | 14 | 19,523 | + 894 |
| West Ham Corporation ... ... ... | 5,926 | 5,890 | 5,921 | 5,905 | ... | 6,545 | 6,107 | 6,027 | 6,090 | ... | 13½ | 83,273 | + 2,436 |
| Wolverhampton Corporation ... ... | 5,889 | 6,143 | 6,062 | 6,062 | ... | 7,514 | 5,592 | 5,770 | 5,770 | ... | 14 | 78,096 | — 1,545 |
| York Corporation ... ... ... ... | 1,610 | 1,516 | 1,395 | 1,489 | ... | 1,675 | 1,595 | 1,516 | 1,558 | ... | 15 | 22,440 | + 1,912 |

## Underground Electric Railways Company of London, Limited.

| NAME OF COMPANY | 1929. WEEKS ENDING June 15 | June 22 | June 29 | July 6 | ... | 1930. WEEKS ENDING June 14 | June 21 | June 28 | July 5 | ... | AGGREGATE. Wks. | 1930 | Increase or Decrease |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Underground Rlys. (Common Fund Co.) | 304,100 | 301,300 | 309,300 | 298,400 | ... | 346,900 | 317,400 | 326,500 | 331,500 | ... | 27 | 8,139,400 | + 560,800 |
| London and Suburban District ... .. | 44,900 | 44,400 | 45,300 | 43,600 | ... | 53,000 | 46,500 | 47,200 | 49,100 | ... | 27 | 1,185,900 | + 96,400 |

## Colonial and Foreign Tramway Traffic Returns.

| NAME OF COMPANY OR CORPORATION | 1929 WEEKS ENDING June 15 | June 22 | June 29 | July 6 | ... | 1930. WEEKS ENDING June 14 | June 21 | June 28 | July 5 | ... | AGGREGATE. Wks. | 1930 | Increase or Decrease |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Anglo-Argentine ... ... ... ... | 83,878 | 84,783 | 82,235 | 86,083 | ... | 85,174 | 82,252 | 79,089 | 84,819 | ... | 27 | 2,272,458 | — 87,082 |
| Buenos Aires Lacroze ... ... ... | 12,222 | 12,402 | 14,718 | 11,825 | ... | 11,349 | 11,349 | 11,175 | 10,011 | ... | 1 | 10,011 | — 1,814 |
| Calcutta ... ... ... *Rupees* | 123,085 | 121,137 | 121,436 | 124,910 | ... | 104,416 | 104,375 | 101,875 | 102,010 | ... | 26½ | 3,028,178 | — 374,664 |
| Madras (2 weeks) ... ... *Rupees* | 45,117 | ... | 42,660 | ... | ... | 46,216 | ... | 42,076 | ... | ... | 2½ | 518,531 | + 28,473 |

| | 1929. Jan. | Feb. | Mar. | April | May | June | 1930. Jan. | Feb. | Mar. | April | May | June | AGGREGATE. Mths. | 1930 | Increase or Decrease |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Brazilian Trac. $ | 3,892,833 | 3,755,709 | 3,928,550 | 4,042,145 | 4,206,895 | 4,210,893 | 3,862,089 | 3,798,698 | 4,017,036 | 4,127,492 | 4,304,160 | ... | 5 | 20,139,475 | + 313,343 |
| British Columbia $ | 1,256,252 | 1,192,871 | 1,243,592 | 1,205,482 | 1,165,279 | ... | 1,354,314 | 1,246,551 | 1,258,375 | 1,213,993 | 1,203,292 | ... | 11 | 13,514,147 | + 599,302 |
| Burma ... Rs. | 64,372 | 63,808 | 68,993 | 64,744 | 66,017 | 63,157 | 62,533 | 63,098 | 72,758 | 65,482 | 66,320 | ... | 10 | 643,528 | — 22,026 |
| Cape Town ... | 31,777 | 28,274 | 30,121 | 29,244 | 29,366 | 27,995 | 31,036 | 27,479 | 30,087 | 27,500 | 27,286 | ... | ... | ... | ... |
| Carthagena & H. ... | 732 | 972 | 853 | 1,063 | 725 | 1,476 | 1,351 | 1,286 | 1,003 | 905 | 552 | 515 | 6 | 5,612 | — 209 |
| Durban ... ... | 23,916 | 21,848 | 24,442 | 25,603 | 21,518 | 24,308 | 24,577 | 21,321 | 23,662 | 24,002 | 23,945 | ... | 10 | 238,483 | — 714 |
| East India ... | 3,562 | 3,055 | 3,892 | 3,798 | 3,862 | 3,772 | 3,553 | 3,127 | 3,863 | 3,601 | 3,698 | 3,803 | 11 | 41,627 | + 438 |
| Kalgoorlie ... ... | 1,531 | 1,433 | 1,682 | 1,673 | 1,747 | 1,660 | 1,454 | 1,437 | 1,710 | 1718 | ... | ... | 4 | 6,319 | Nil |
| Para ... ... | 14,028 | 14,007 | 14,971 | 15,060 | 15,182 | 15,450 | 14,556 | 13,628 | 14,976 | 15,564 | 15,568 | 15,028 | 7 | 103,807 | + 749 |
| Port Elizabeth ... | 9,293 | 7,478 | 7,857 | 7,877 | 7,601 | 7,335 | 9,016 | 7,110 | 8,127 | 7,521 | 7,552 | ... | ... | ... | ... |
| Rangoon ... Rs. | 116,835 | 114,300 | 121,246 | 120,855 | 121,040 | 114,535 | 155,080 | 140,130 | 164,600 | 148,215 | 149,440 | 142,170 | 6 | 899,635 | + 190,824 |
| Shanghai ... $ | 319,220 | 294,708 | 339,785 | 336,624 | 339,833 | 335,740 | 363,400 | 322,473 | 377,849 | 308,840 | 183,409 | 367,231 | 6 | 1,923,202 | — 42,708 |
| Singapore ... $ | 115,000 | 117,000 | 133,000 | 131,000 | 133,000 | 123,000 | 139,000 | 128,000 | 143,000 | 137,000 | 148,000 | 140,000 | 9 | 1,223,000 | + 140,000 |
| Winnipeg ... $ | 607,966 | 570,895 | 572,492 | 536,033 | 534,954 | 517,738 | 628,979 | 567,569 | 571,157 | 516,132 | 509,709 | ... | 5 | 2,793,546 | — 28,794 |

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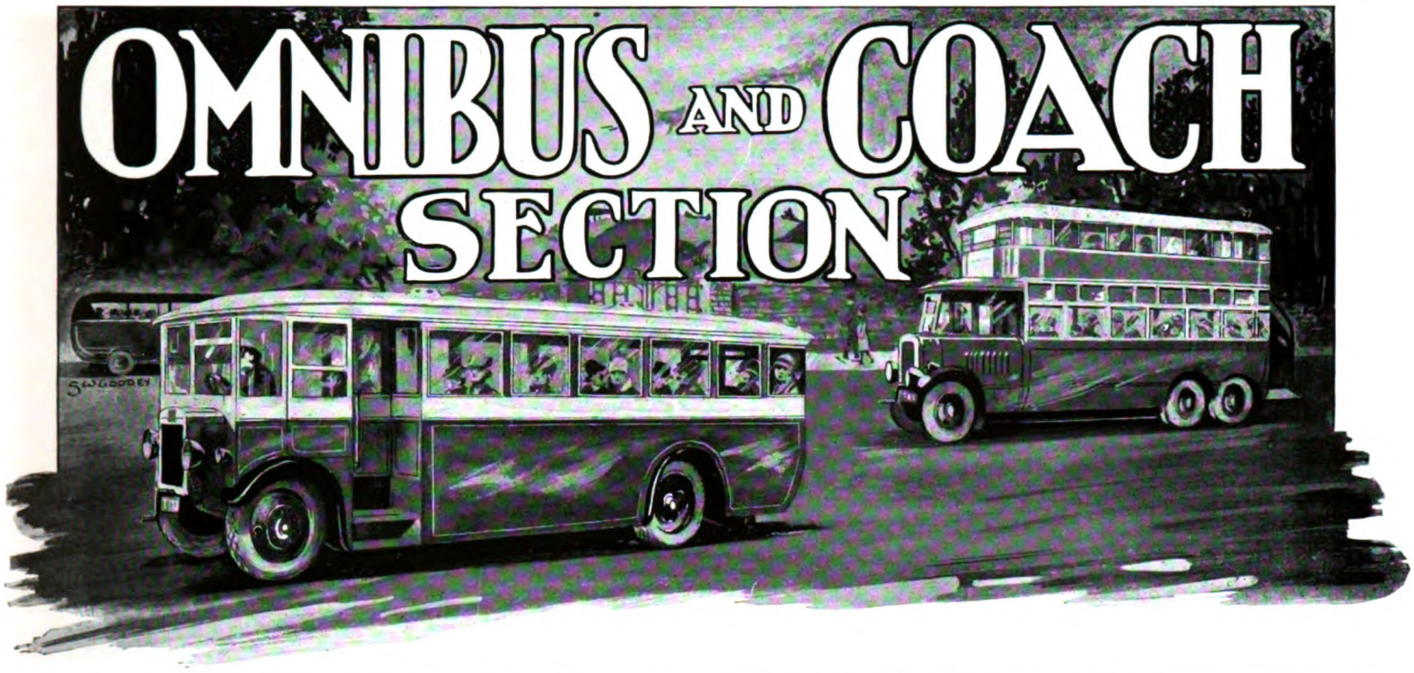


**OMNIBUS AND COACH SECTION—TWENTY-FIFTH YEAR OF PUBLICATION.**

### RAIL AND ROAD CO-ORDINATION.

The negotiations between the railway companies and omnibus companies in this country have progressed with considerable rapidity, as will be seen from the particulars given on a following page. At the present time working arrangements have been made with some 50 omnibus companies and their subsidiaries. In some cases the railway companies have acquired a controlling interest in the omnibus companies; in others they have a half share or a substantial interest. An interest has also been acquired in a few municipal omnibus undertakings. How exactly the schemes will work out financially for the railway and omnibus companies remains to be seen, but at all events the arrangement is better both for the companies and the public than cut-throat competition would be. Some of the omnibus companies did not appear very willing to enter into such combinations, but they evidently could not help doing so, seeing that they had to face the great resources of the railway companies. There do not seem to be any complaints that the deals were unfair. The public are getting the advantages of inter-available return tickets, arrangements to facilitate exchange of passengers, adjustment of services, employment of omnibuses in extension of railway journeys, and combined tours. The prospects are attractive. There may, of course, be some detail modifications when the Road Traffic Bill with its area commissioners comes into operation.

### THE LONG-DISTANCE OMNIBUS.

It is to be regretted that more pioneers of long-distance services did not take part in the discussion at the Institute of Transport Congress on Mr. W. J. Thomson's paper on long-distance services. The conclusions arrived at by the director of the Scottish Motor Traction Co. are valuable and interesting, but they are tinged with the greatest caution as to developments in the future. This may be a correct attitude for a company that has come through the pioneer stage and achieved combination with the two great northern railways. The attitude is not, however, in harmony with the spirit that led to the institution of these services less than five years ago by individual operators. To the courage of these men in taking advantage of the improvements in coaches the country owes these all-the-year-round facilities, as well as some of the improvements in both long-distance and ordinary service omnibuses. If one were to judge by the number of applications that have been made to Watch Committees for new and augmented services this summer the traffic might be regarded as a gold-mine. It is apparent, however, that this pegging out of claims is in anticipation of the Road Traffic Bill becoming law, but operators who obtain licences now for either long-distance or for service omnibuses will find that possession does not constitute nine points of the law. The area commissioners to be constituted under the measure may issue licences only to vehicles certified as fit, and only if the proposed services are necessary. With the new legislation in force it will be easy to eradicate the individual operators who have thrived on their preferences for summonses instead of licences, or by working employees unreasonable hours at inadequate wages. There are others among the pioneers —as distinct from those who are only pleasure-coach owners—who have adopted precautions so that they shall not be overtaken by the usual fate of the individual who introduces an innovation. They have strengthened their resources by forming small companies and improved their facilities for the upkeep of their vehicles. In these operators Mr. Thomson will find coadjutors as ready as he is to view new proposals with circumspection, and as strongly convinced that this traffic is almost wholly new and has come to stay.

### PLY-FOR-HIRE LICENCES.

Pending the setting up of the proposed Area Commissioners as provided for in the Road Traffic Bill now before Parliament, there appears to be a marked difference of opinion in the minds of the present licensing authorities as to the proper course they should take when considering new applications for ply-for-hire licences. This fact was brought pro-

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# OMNIBUS AND COACH SECTION

minently to public attention in a recent Ministry of Transport inquiry held at Leeds. In this case there was an appeal against the decisions of the Leeds and Huddersfield Corporations not to grant ply-for-hire licences to a Blackpool omnibus proprietor who proposed to run a daily service between those towns and Blackpool. From the statements made by the Town Clerk of Huddersfield it appears to be a very keen desire on the part of operators, or would-be operators, to obtain licences for omnibus and coach services throughout the North of England at the present time, and there is good reason for the contention that, as long-distance services will be regulated and co-ordinated by the proposed Area Commissioners, the granting of new licences should be restricted until their appointment. On the other hand, the Watch and Transport Committees of Blackpool express surprise that the licences have been refused. The points raised at the inquiry clearly indicate the advisability and, indeed, the necessity of an independent authority for controlling the licensing of public service vehicles. Naturally, the Blackpool Corporation desire that the fullest advantage should be taken of every means of transport to bring the largest possible number of people to Blackpool, while the ever-increasing traffic difficulties in towns like Leeds and Huddersfield must necessarily cause those responsible for traffic regulation to view additions to the number of vehicles having "pick-up" rights with disfavour and to question their necessity or suitability.

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### DAZZLING HEADLIGHTS.

With the large increase of regular long-distance motor services, the question of dazzling headlights will shortly assume an even more serious aspect than at present for all users of the public highway. In order to maintain the average speed necessary for the completion of the journey in schedule time, brilliant illumination of the road is essential. The danger, however, of meeting lights which have a blinding effect on the driver at the moment when he is required to exercise the utmost care in order to avoid collision, is a very real one. The new regulation of the Ministry of Transport, calling for dipping head lights, will in some measure relieve the position on more or less straight roads, but as the illuminated area will be restricted as a consequence, the risk of running down stationary or slow-moving vehicles is serious. There can be no question that the ideal system is one that would permit the full illumination of the road and at the same time be safe for the drivers of oncoming traffic, and it is a matter for regret that, in spite of the efforts of the Royal Automobile Club in organising trials and offering awards to encourage inventors, no satisfactory anti-dazzle device has yet been discovered. In the memorandum which the Club has prepared at the request of the Minister of Transport, the opinion is expressed that the recent devices submitted show little or no improvement on the earlier designs. It also contains a number of suggestions which in the absence of an anti-dazzle device should certainly do something to make night-driving safer both for the pedestrian and the vehicle.

## CO-ORDINATING RAIL AND ROAD TRANSPORT.

A List of the Associated Undertakings.

Considerable progress has been made by the railway companies in the co-ordination of rail and road passenger traffic since they were granted powers last year to interest themselves in motor traffic. Shortly after obtaining road powers the companies effected working agreements with the more important omnibus companies. Arrangements are being made under these agreements for the co-ordination of rail and road passenger traffic. The railway companies have acquired a financial interest in various omnibus companies, but in no case is this interest a controlling one. In some cases the railways held the same number of shares as the original proprietors, thus setting up an equality of interest.

The negotiations entered into by the companies fell mainly under two headings: (1) with the municipal corporations and (2) with the principal road transport companies. The latter are controlled and directed by a few groups, the principal of which are the Tilling and British Automobile Traction and British Electric Traction Group; the National Omnibus and Transport Co.; the Scottish Motor Traction Co., and the National Electrical Construction Co.

Joint committees, consisting of an equal number of representatives of the railway and omnibus companies, have been constituted to propose measures by which the services of the two modes of transport can best be co-ordinated. There has thus been established between the parties to the agreements a medium for exchanging ideas for the benefit of the public as well as of themselves.

As the relations of the railways with the municipalities have always been of an amicable character, it was natural that the question of co-operation with the latter in the conduct of their road services should have arisen at an early stage. Negotiations began first with the municipal authority of Sheffield, and the basis of the agreement entered into with that body by the L.M.S. and L.N.E.R. companies was that the Corporation retained sole control of the intra-mural omnibus routes; the railway companies purchased a half share in the suburban municipal omnibus services which are now worked jointly, and purchased outright certain long-distance services. Similar arrangements have been made with Halifax and Leeds Corporations and the companies are in negotiation with other municipalities. An interest has also been acquired in Huddersfield Corporation Omnibus Department.

A list of omnibus and coach undertakings with which the railways are concerned is appended:—

LONDON, MIDLAND & SCOTTISH RAILWAY.

*Associated Omnibus Companies:—*

Ayrshire Pullman Service.
Birmingham and Midland Motor Omnibus Co., incorporating: Black & White Motorways (jointly with Great Western Railway).
Crosville Motor Service, incorporating:—
- Llandudno Coaching & Carriage Co.
- Brookes White Services, Rhyl.
- U.N.U. Motor Services, Carnarvon.
- Mona Maroon Services, Holyhead.

Cumberland Motor Services.
Glasgow General Omnibus and Motor Services.
Greenock Motor Co. and L.M.S. Joint Omnibus Services.
Highland Transport Co.
L.M.S. and Mansfield and District Tramways Co. (Joint Service).
Ribble Motor Services, incorporating:—
- Rishton & Antley Motor Co.
- Furness Omnibus Co.

The L.M.S. has also acquired an interest in Huddersfield Corporation Omnibuses.
The L.N.E.R. and L.M.S.R. are jointly interested in the following:—

East Midland Motor Services.
Lincolnshire Road Car Co.
North-Western Road Car Co.
Ortona Motor Co.
Peterborough Electric Traction Co.
Trent Motor Traction Co.
West Yorkshire Road Car Co.
Yorkshire (Woollen District) Electric Tramways.
Eastern National Omnibus Co.

Scottish Motor Traction Co., incorporating:—
- W. Alexander & Sons.
- Scottish General Omnibus Co.
- Scottish General (Northern) Omnibus Co.
- Simpsons & Forresters.
- Pitlochry Motor Co.
- General Motor Carrying Co.
- Midland Bus Services.
- Hebble Omnibus Services.

The L.N.E.R. and L.M.S.R. have jointly acquired an interest in the undermentioned municipal omnibus undertakings: Sheffield, Halifax and Leeds.

LONDON & NORTH-EASTERN RAILWAY.

*Associated Omnibus Companies:—*

Eastern Counties Road Car Co.
East Yorkshire Motor Services.
Northern General Transport Co.
United Automobile Services.

GREAT WESTERN RAILWAY COMPANY.

*Associated Omnibus Companies:—*

Western National Omnibus Co.
Western Welsh Omnibus Co.
Devon General Omnibus & Touring Co. (jointly with Southern Railway).
Bristol Tramways & Carriage Co.
City of Oxford Motor Services.
Birmingham and Midland Omnibus Co. (jointly with L.M.S.).
Wrexham & District Transport Co.

SOUTHERN RAILWAY.

*Associated Omnibus Companies:—*

Aldershot & District Traction Co.
Devon General Omnibus & Touring Co. (jointly with the G.W.R.)
East Kent Road Car Co.
Hants & Dorset Motor Services.
Maidstone & District Motor Services.
Southdown Motor Services.
Southern National Omnibus Co.
Southern Vectis Omnibus Co.
Wilts and Dorset Motor Services.

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# OMNIBUS AND COACH SECTION

## PREMIER LINE COACHES.

### Windsor-London Fifteen Minute Service.

In January last the Premier Line Coaches started an hourly limited-stop service from Windsor to London, via Eton, Slough, and Colnbrook. To-day it is a fifteen-minute service, and at busy periods it is barely adequate to supply the public demand for seats. On Sundays these coaches now run at intervals of eight minutes, and at this season of the year it is not unusual to see passengers waiting in a queue for accommodation.

On first consideration it might be thought that there would be little demand for such a service, except in the height of the summer season, when the historic Windsor Castle, the famous school at Eton, and the beauty of this part of the Upper Thames draw a constant stream of visitors. The promoters, however, evidently regarded it as an opportunity and are being rewarded for their judgment and enterprise.

The service is operated by the Premier Omnibus Co., Ltd., whose registered office and garage are at Leysfield Road, Shepherds Bush, London, W.12. The managing directors are Mr. William Allen and Mr. F. Schiffer. In a talk with a representative of the TRAMWAY AND RAILWAY WORLD, Mr. Allen said the company started with nine coaches and they now operate twenty, while a further twenty are on order, but not necessarily for the Windsor service, as new routes are contemplated.

One of the Premier Line Coaches—a Duple 26-seat body on "Titan" Chassis.

#### COACH ON "TITAN" CHASSIS.

Mr. Allen is naturally proud of his company's vehicles, which can scarcely be excelled to-day either for mechanical efficiency or the beauty and comfort of the coachwork with its galaxy of fittings and luxurious roomy seating accommodation. All the chassis are Leyland "Titan," and the bodies are by Duple Bodies and Motors, Ltd., of Hendon. A coach body on a "Titan" chassis is unusual, as this chassis is of course intended for double-deck bodies. In this way, however, the company gets interchangeability between their coaches and the omnibuses which they also operate in the metropolitan area.

Only one slight alteration was made in the standard chassis. Normally these are fitted with gaiters on the steering joints, but owing to the regulations the chassis for the Premier service had to be delivered without gaiters. It is of relatively light weight, and this, in conjunction with the improved six-cylinder engine, permits of high speeds while ensuring smooth operation. By off-centring the engine and the axle the height of the chassis has been reduced to a minimum, hence an advantage of the Premier service, from the passenger's point of view, is that only one step is necessary to get into the cab; the low floor level also ensures great stability at speed, due to the low centre of gravity.

The engine is rated at 38.4 H.P., which develops 55 H.P. at 1,000 R.P.M. Having an exceptionally low speed torque, it is very flexible, pulling smoothly on top gear at all speeds between three and fifty miles per hour. All the engine auxiliaries are placed on the near side for accessibility. Overhead valve gear is fitted, the camshaft rotating in oil in a deep trough in the detachable cylinder head. The radiator has a large surface and owing to its height a continuous waistband is obtained all round the coach, which enhances its appearance. The 4-speed gearbox is of unit construction with the engine, the change-speed mechanism and selector gear being withdrawable without disturbing the gears or shafts. From the gearbox the drive is taken, through Spicer couplings, to the underslung worm final drive.

The front axle design embodies an improved form of front wheel brake operated through the hollow king pin, a new type of roller thrust race washer, and a special form of steering rod. As the braking system, which consists of six pairs of interchangeable shoes, is not compensated, failure of one set does not affect the other five. The Dewandre-servo foot-brake acts on all four wheels and the hand-brake on the rear wheels only. The springing is an attractive feature. Long chrome-vanadium springs are provided, with deep section rubber buffers above the axles. Shock absorbers are fitted to the front axle. All chassis lubricators are grouped in four sets arranged in accessible positions, the oil passing to the desired points through copper piping.

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# OMNIBUS AND COACH SECTION

THE COACHWORK.

The body is a 26-seat Pullman de luxe saloon. Normally the design accommodates thirty, but in their wish to please the travelling public the Premier company sacrificed four seats to provide more leg and body room, and no doubt this thoughtfulness is partly responsible for the popularity of these coaches.

Duple Bodies and Motors, Ltd., have turned out a very graceful piece of coachwork. The design is tastefully carried out with perfect balance and symmetrical lines, giving a well-balanced appearance to this Leyland "Titan." It is constructed in such a manner that it is light, with steel flitch plates which give the necessary rigidity and strength. The seats are of semi-armchair pattern with arm rests, foot rests being also fitted in each seat. All seats are constructed with under woven spring frame, and along the sides of the coach are communication bells—four on each side we counted—this easy method of signalling to the driver being a convenience which is greatly appreciated by passengers. On the two doors, which are on the near side, there are special sunken handles, both inside and out. The panelling below the waistline is of silver steel, and above the waistline of aluminium, all wooden parts being capped with metal. Ample accommodation is provided for luggage on the roof and in side lockers, while special parcel nets and racks run the whole length of the vehicle, for accommodating light parcels, rugs, etc.

Near Side showing sunken door handles.

Rear View showing illuminated indicator in waistline.

The "Quicktho" mechanism is fitted to the all-metal window frames, so that any window can be raised or lowered by pressure of fingers and thumb. The metal acts as a guardrail and eliminates the continual breaking of windows; plate-glass is fitted throughout. The joinery work is of highly-polished walnut; the seats are of a very luxurious type, upholstered in special moquette, facing forward, with leather-edged wearing pieces to arms, etc., an ash-tray being fitted to every two seats. Fibre mats are laid all over the floor, these being manufactured and supplied by the St. Dunstan's Blinded Soldiers' Institute.

Special attention has been given to ventilation by glass louvres in the roof, besides the windows. The vehicle is well equipped with electric lights, and each window is fitted with an easy sliding curtain. Outside lighting of both front and rear of the vehicles takes the form of destination indicators, the rear indicator, as will be seen from our photograph, being inset in the curved waistline. In the bulkhead behind the driver is a bevel-edged mirror and a Smith's special eight-day ship's clock. The finishing touch to these handsome coaches is given by colours of red and cream.

A regularity of traffic is to some extent assured by the number of season ticket holders travelling daily between Windsor and London. About 70 per cent. of the passengers, however, are shoppers and pleasure seekers. The following table shows the season ticket rates and the day fares between different stages:—

SEASON TICKET RATES.

| Between | *Weekly* | *Monthly* | *Quarterly* |
|---|---|---|---|
| Windsor and London .. .. .. | 13s. | £2 | £5 10s. |
| Windsor and Hammersmith .. .. | 11s. | £1 15s. | £5 |
| Slough and London .. .. .. | | | |
| Slough and Hammersmith .. .. | 9s. | £1 8s. | £3 17s. |
| Colnbrook and London .. .. .. | | | |

Seating arrangement in the Premier Coaches.

Seating accomodation looking forward.

ORDINARY FARES.

| | | | | |
|---|---|---|---|---|
| Windsor and London .. .. | 2s. 0d. | single. | 3s. 6d. | return |
| Windsor and Hammersmith .. | 1s. 9d. | ,, | 3s. 0d. | ,, |
| Slough and London .. .. | 1s. 9d. | ,, | 3s. 0d. | ,, |
| Slough and Hammersmith .. | 1s. 6d. | ,, | 2s. 6d. | ,, |
| Colnbrook and London .. .. | 1s. 6d. | ,, | 2s. 6d. | ,, |
| Colnbrook and Hammersmith .. | 1s. 3d. | ,, | 2s. 0d. | ,, |
| Hammersmith and London .. | 1s. 3d. | ,, | 2s. 0d. | ,, |

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# OMNIBUS AND COACH SECTION

RUNNING TIMES.

The journey occupies 85 minutes, long enough to give the business man time to read his paper and not too long for the shopper. In each direction the first coach starts as early as 6.30 in the morning—the London terminus being at Bush House—and the last at 12.15 a.m., so that residents in Windsor or on intermediate points along the route have time to attend the evening entertainments in town and be assured of comfortable travel back. The coaches are thus on the road for over seventeen hours out of the daily twenty-four. On Sundays, when the service is more frequent, the first coach starts at 8 a.m., and the last at 12.15 a.m. Passengers may board a coach anywhere on the route by hailing the driver, and our experience was that the drivers readily act upon these signals. There are of course a number of authorised stopping places. Tickets are issued on the coaches by uniformed collectors at stated points. In London the route is via Hammersmith Broadway, Piccadilly Circus and Charing Cross, and it is interesting to give the approximate running time between points :—

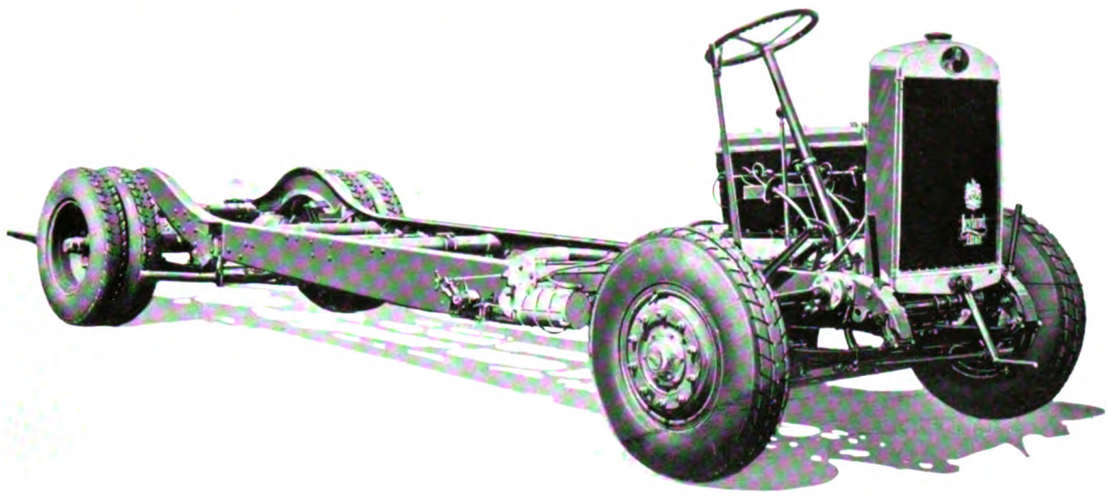
APPROXIMATE RUNNING TIME BETWEEN POINTS.

| | Minutes. | Minutes. |
|---|---|---|
| WINDSOR | — | — |
| Eton | 5 | 5 |
| Slough | 5 | 10 |
| Colnbrook, The Plough | 12 | 22 |
| Great West Road, Travellers' Friend | 15 | 37 |
| Great West Road, Firestone Tyre Factory | 7 | 44 |
| Chiswick High Road, The Crown | 3 | 47 |
| Turnham Green Church | 2 | 49 |
| Chiswick High Road, Young's Corner | 2 | 51 |
| Goldhawk Road, " Queen of England " | 2 | 53 |
| Goldhawk Road, Seven Stars | 3 | 56 |
| Hammersmith, The Grove | 3 | 59 |
| Hammersmith Road | 3 | 62 |
| Addison Bridge | 3 | 65 |
| Kensington | 8 | 73 |
| Knightsbridge | 3 | 76 |
| Hyde Park Corner | 3 | 79 |
| Piccadilly | 3 | 82 |
| LONDON, Bush House, Strand | 3 | 85 |
| | TOTAL 85 MINUTES. | |

Apart from the mechanical efficiency and comfort of the coaches, a feature of the service that appeals to the passenger is the invariable courtesy of the uniformed officials, both at Bush House and at Windsor, and, as already mentioned, the willingness of the drivers to pull up on the route when hailed by intending passengers.

The company, which was formed in 1923, also operates three omnibus services in the metropolitan area—Hampton Court to East Ham, Hampton Court to Stoke Newington, and Edgware to Old Ford. In January of this year the company took delivery of the first double-deck body—a 52-seat covered-top omnibus on a " Titan " chassis—produced at the Duple works, and since then of course several similar vehicles have gone on the roads. These omnibuses have a number of novel features, such as glass eaves over the drop windows on the sides bearing the name of the company, and rounded corners in the fixed upper windows, while the upstairs seats are fitted with ash trays. The vehicles are of well-balanced and pleasing appearance.

The Premier Company maintains well equipped repair shops and believes in keeping its vehicles not only efficient mechanically but in trim and fresh condition.



The " Titan " Chassis, intended for double-deck omnibuses, is used for the Premier Coach body.

## TROLLEY BUSES PROPOSED FOR DURBAN.

Mr. J. A. Bromley, general manager and engineer of the Durban Corporation Tramways Department, has recommended to the Town Council the substitution of trolley buses for tramcars. The substitution would be gradual, beginning with the routes from Post Office to Point and from Post Office to Marine Parade. He estimates that the substitution of these vehicles will effect a saving of £55,000 for the renewal of the present tramway track and £2,300 a year in track maintenance.

So far Bloemfontein is the only town in South Africa to use trolley buses, but Mr. Bromley had considerable experience of them in England. He was formerly general manager of the tramways of Keighley and York Corporations, and for nine years he was rolling-stock superintendent at Leeds, where the trolley bus system was first introduced in 1911. In support of his proposal Mr. Bromley has stated that the question of gradient would present no difficulty. In Durban there were no hills that could compare with some of the gradients over which trolley buses operated at Leeds and Keighley. Present-day trolley buses, too, were a vast improvement upon the vehicles of those early days.

It will enable the general manager to emphasise that fact if manufacturers will send him their illustrated brochures and other publications. The vehicles which Mr. Bromley evidently has in view are double-deck, capable of seating sixty to seventy passengers.

The Tramways and Motors Department of the Durban Corporation also runs a number of omnibus tours in the borough and the surrounding districts. The vehicles used for operating this service are omnibus-de-luxe, of the latest enclosed type, well sprung and luxuriously fitted. For taking parties of visitors on tours of the borough's attractions open promenade runabouts are used. During the past year the omnibus fleet has been increased by 100 per cent.

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# OMNIBUS AND COACH SECTION

## LONG-DISTANCE BODY BY STRACHANS.

The accompanying illustrations show that Strachans (Acton), Ltd., have provided a pleasing and very serviceable body for coaches operated by the new Western National Omnibus Co., a subsidiary of the National Omnibus and Transport Co. The exterior colours are black for the roof, cream for the uppers and waist, and lake for the body. Scotland Yard requirements are complied with by the body, which has a Hemmings central sliding head fitted to the roof, giving a clear inside headroom of 5 ft. 10 in.

In view of the long-distance work of these coaches, full width

Long-Distance Coach—Western National Omnibus Co.

luggage accommodation is provided between the floor and the top of the chassis frame. Entrance and exit is by two full coach doors on the near side, each fitted with a drop light. All side windows are made to lower and are of the improved "W. M." type by Strachans. All seats face forward, and are of the Strachan company's own design. These seats have been standardised by the National Omnibus and Transport Co. for use on all their long-distance coaches.

Special attention has been given to the design of the front end

Interior of Strachans' Long-Distance Coach.

of the body in order to avoid the "boxy" appearance usually associated with forward control vehicles. Adequate ventilation is provided in the driver's cab by means of a large pivoted windscreen at the front, sliding windows on both sides, and a hinged ventilator in the roof. Polished walnut woodwork, seats and panels finished in flowered moquette, chromium plated metal fittings, and brown doverite finish to handrails, etc., combine to make the interior of the vehicles most attractive. The outside metal fittings are also chromium plated.

WOLVERHAMPTON TROLLEYBUS SYSTEM was inspected by another deputation from Germany on June 23. The visitors included Herr G. G. Kemmann (consulting engineer, Berlin), Dr. Bracht (Mayor of Essen), and Herr W. Kern (general manager, Essen tramways). They were received by the Mayor (Councillor Alan Davies), who is chairman of the Transport Committee, and Mr. C. Owen Silvers (transport manager), and made a journey on one of the omnibuses.

## BOURNEMOUTH EXPRESS OMNIBUSES.

A good example of the way in which the needs of the travelling public in the outlying districts of a large town may be promptly met has to be credited to Bournemouth Corporation Tramways Department. The popularity of Bournemouth as a residential centre has led of late years to the opening up of what have become populous centres beyond the area of the excellent tramway facilities on lengthy routes to the sea front. In order that the new localities should be provided with rapid communication, Mr. I. Bulfin, the engineer and general manager, recommended the establishment of an express service of single-deck omnibuses of good capacity, the fares charged to be higher than those obtaining on cars and the other omnibuses running to less speedy schedules and making more stops.

The result was that the Corporation placed, through the Tramways Committee, an order with John I. Thornycroft & Co., Ltd., for twelve B6-type six-cylinder forward control chassis running on balloon tyres and exceedingly well sprung. One of these handsome

Thornycroft Express Omnibus at Bournemouth.

saloons with a low-loading line is shown in the appended photograph. The easy entrance is of special importance in a health resort where there are residents as well as visitors who have come to recuperate. Passengers are pleased with the comfortable saloons and the excellent ventilation.

As the scale of fares is commensurate with the increased facilities which are offered by this type of vehicle it is hoped that the financial result will be favourable. The area in which these Thornycrofts operate has a length of ten miles from Southborne in the east to Westbourne on the Poole boundary. Inland it extends to Moordown.

## RAWLINGS' DEVELOPMENTS.

The growing popularity of the various types of coach-window regulators and fittings manufactured by the Rawlings Manufacturing Co., Ltd., of Larch Road, Balham, S.W.12, has made it necessary for the firm again to increase its factory accommodation. The new building, which has just been occupied, includes a very full and up-to-date nickel plating as well as chromium plating plants. These will enable Messrs. Rawlings to meet the demand of the municipal, railway and other large operators of motor coaches, some of whom demand elaborate finishes in bronze, silver, and other styles, in their own works. A further advantage of the factory extension will be the more prompt delivery of the Rawlings' fittings. In this connection it may be mentioned that the firm have now in service a fleet of their own motor vans for effecting distribution in all parts of the country. Messrs. Rawlings inform us that they have on hand large orders for the railway groups, and at present have on test an entirely new model which promises to give excellent service for certain types of vehicles. Particulars of this new model will be given in these columns when the manufacturers are satisfied that it meets in actual service with the success they anticipate.

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# OMNIBUS AND COACH SECTION

## PLACE OF LONG-DISTANCE OMNIBUSES IN NATIONAL TRANSPORT.

A Paper and Discussion at the Institute of Transport Congress.

The proceedings at the annual congress of the Institute of Transport, held at Glasgow on July 8 to 10, included a paper by Mr. Wm. J. Thomson, director of the Scottish Motor Traction Co., entitled "Long-Distance Omnibus Services—their Place in the National Scheme of Transport." Sir Josiah Stamp, president of the Institute, occupied the chair.

Mr. Thomson remarked that in an incredibly short time every important centre in the United Kingdom had been linked up by omnibus services. One might travel from London at almost any hour of the day to Bristol, Liverpool, Manchester, and Birmingham, while between London-Newcastle, London-Edinburgh, and London-Glasgow, services were in operation day and night. There was an excellent service between places as far apart as Inverness and London. Leaving Inverness at 9 a.m. the passenger arrived in London the following morning, a distance of 572 miles.

### A New Class of Traveller.

The development in omnibus service had created a new class of traveller, sightseer, or passenger, who only awaited the opportunity of seeing something of his own land. Comfortably seated in what was practically his own car, with his own driver, the long-distance passenger was inspired with an extraordinary sense of personal and actual possession that was entirely novel. The beauty of the countryside, the friendly intercourse that invariably manifested itself while travelling on the road, all combined to give a personal and spontaneous interest throughout the journey that was not present to the same degree in other forms of transport. Here they had entered upon an entirely new phase of travel. Asking what effect other forms of transport, and particularly railway travel, were likely to have on omnibus traffic, the author expressed gratification that the railway mind was more closely in harmony with the road mind than he expected in such a short time. This augured well, not only on account of the great financial interests involved, but the welfare of the travelling public. While the omnibus and coach might have taken traffic from the railways, the great bulk of it was entirely new, and would not have come into being but for the development of the omnibus and coach. There were many people who valued money saved more than time saved, and while the railways would continue to get the people who valued their time, all classes and all tastes should be catered for.

### Scope for Expansion and Development.

This brought up the question whether the railways could effect a drastic reduction in fares to meet the needs of the former class and yet make ends meet. A reduction in fares by special trains might deplete the revenue of the ordinary trains, and the question arose whether the railways could afford that step. Should the railways find it possible to further reduce their long-distance fares and make a profit, as a long-distance road operator he would welcome that step, as he was convinced that it would add materially to the great and ever-increasing volume of traffic both by rail and road. The desire to travel was increasing and would continue to do so. On the other hand, the question arose as to whether omnibus and coach companies could afford to continue at the present fares. His view, based on a long experience, was that he saw no reason why they should not continue somewhere near the present fares. They were likely to be faced with increased costs in certain directions, the tendency being towards vehicles of luxury and refinement, but there was every likelihood of reduced costs in other directions. The immediate future held great possibilities of expansion and development. For the time being the companies were wise in establishing on a sound and economical basis main long-distance through or non-stop routes between well-defined points, but the natural development from this would doubtless take the form of a certain number of limited stops at important points or junctions along the routes, whereby passengers would be able to proceed to other centres across country. In other words, he foresaw great highway lines, not only running north and south but east and west, embracing a large area with great potentialities for public service, convenience, and accessibility. Such a development could only be evolved out of a long experience on the part of the leading omnibus operators. The process would necessarily be gradual, and the expansion could only be accomplished by the leading omnibus companies collaborating one with another. While he looked forward to the future with no misgivings, he could not too strongly urge the importance of entering upon these extensions with the utmost regard, not only for the public need, but the economic and efficient administration of the services. Unhealthy competition and inexperienced operations were to be deprecated. The business called for the highest measure of skill and experience—technical, financial, and administrative—and proposed new routes or extended services should only be promoted after the most careful deliberation. He welcomed the co-ordination of road and railway interests as being all to the ultimate good of the public. He looked upon the further development of long-distance road travel as in no sense competing with railway interests, but as a lively awakening of a new desire to travel. They were only at the threshold of a great and far-reaching development in motor road transport in this country. Coaches would improve in design and workmanship, roads would continue to improve, and many bridges would be built.

### The Discussion.

Mr. Ashton Davies, of the London Midland and Scottish Railway, said that the motor coach had its proper purpose when used for private hire journeys and short trips, but the long-distance coaches were provided primarily for people who preferred to travel by train but could not resist the lower fare of the coaches. Reviewing road transport in relation to the welfare of the national transport systems, it was apparent that an unlimited development in long-distance omnibuses must be at the expense still further of the railways and could not be to the common good.

Mr. O. Cecil Power, traffic manager, Birmingham and Midland Omnibus Company, declared that not 10 per cent. of long-distance services were paying. The proposed speed limit for their vehicles of 30 m.p.h., which he was afraid would be rigidly adhered to, would be the death-knell of long-distance services. He would rather have the present elastic limit of 20 m.p.h. which enabled them to travel at 50 m.p.h.

Mr. F. G. Bristow, Commercial Motor Users' Association, said there were 150 toll roads and bridges and about 250 level crossings. If these could be got rid of a great service would be done to the travelling public.

Dr. K. G. Fenelon, Edinburgh University, said that the greater number of passengers on long-distance omnibuses seemed to be ladies. That might be because their time was less valuable and because the cheaper fare was more attractive.

### What Road Congestion May Do.

Mr. C. S. Dunbar, Birmingham and Midland Omnibus Co., considered "express" omnibus traffic ought to be handled by the railways, while the omnibus companies, in co-operation with the railway, should handle purely local and limited-stop traffic. There would be a physical limit to long-distance transport as the congested state of the roads was slowing down the flow of that traffic. The public would not stand that indefinitely.

Mr. J. S. Furphy, Ribble Motor Services, believed it would take a decade or more to find the true economic position of the long-distance omnibus in relation to the railways. At present it was obtaining traffic from the railways very largely because people were experimenting, and in some cases because they valued the money rather than the time. Ultimately, he thought, the economic limit of the long-distance omnibus would be about 100 miles in the summer and 50 in the winter.

The President recounted his investigations into long-distance coach operations in America. Statistics of fifty such services showed a total of 12,267 miles, the longest run being 1,863 miles, the running-time, including all stops, working out at 25 miles an hour. The fares varied from over 3d. to just under 1d. a mile.

Mr. Thomson, in the course of his reply, remarked that he would welcome the limitation of speed to 30 m.p.h. His company endeavoured to keep as near as possible to a speed that did not exceed that figure.

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Increased Petrol Duty in Australia.—New taxes and tariffs imposed by the Commonwealth Government to meet the financial stringency in Australia include an increase of 3d. per gallon on petrol.

Inferior Motor Spirit.—The Parliamentary Committee of Essex County Council reports that instances have arisen where purchasers have not been supplied with petrol of the nature or quality demanded, but with an inferior spirit, sometimes containing petroleum. At present there is no penalty prescribed, and the Committee proposes to ask the Board of Trade to take steps to make it a penal offence.

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# OMNIBUS AND COACH SECTION

## BIRMINGHAM'S LATEST TROLLEY OMNIBUS.

The accompanying illustration shows a double-deck, six-wheel trolley omnibus lately placed in service by the Tramways Department at Birmingham. The vehicle was built throughout at the works of Guy Motors, Ltd., Wolverhampton, and was delivered to Birmingham under its own power. Externally and internally this omnibus has an attractive appearance, and giant pneumatic tyres, effective springing and upholstered seats combine to render a ride in the vehicle a luxurious experience. Another feature is that

Birmingham Corporation Six-Wheel Trolleybus.

apart from the swish of the trolley wheels the operation of the omnibus is noiseless.

An advantage which is appreciated by top-deck passengers in wet weather is that the staircase and platform are enclosed. The seating follows the conventional arrangement in that all seats face forward, except those situated over the wheel arches. Notwithstanding that the overall height is considerably reduced there is ample head room in both saloons. The dimensions as a six-wheeler enable unusual space to be allowed between the seats, thus adding to the general comfort.

## DOUBLE-DECKER WITH EMERGENCY EXIT.

The accompanying illustration shows one of two double-deck omnibuses, with covered tops and fully enclosed staircase, which John I. Thornycroft & Co., Ltd., have supplied to the Notts and Derby Traction Co. Features of the body are the two attractive and well-ventilated saloons and the wide emergency door on the

Thornycroft Omnibus with Emergency Exit.

off-side of the lower deck, just at the rear of the driver's cab. This door can be operated from the interior and from the roadway. The vehicle is of low overall height, and the chassis is the BC six-cylinder forward type.

## SOME RECENT ORDERS.

MORECAMBE TRAMWAYS COMMITTEE has purchased a Maudslay 32-seat omnibus.

MORECAMBE CORPORATION has ordered a motor-fire engine from Leyland Motors, Ltd.

BIRMINGHAM CORPORATION has ordered forty covered-top omnibus bodies from the English Electric Co.

LEYLAND MOTORS, LTD., have an order from Birkenhead Corporation for fifteen double-deck omnibuses.

DENNIS BROS., LTD., have supplied a prison van to Leeds Corporation and a fire pump to West Ham Corporation.

HACKNEY WORKS COMMITTEE has recommended the acceptance of the tender of John I. Thornycroft & Co., Ltd., for the supply of a 5-ton lorry.

SWANSEA HEALTH COMMITTEE has accepted the tender of Karrier Motors, Ltd., for the supply of a motor sweeping machine with tank capacity of 350 gallons.

EAST HAM WORKS COMMITTEE has recommended the acceptance of the tender of Karrier Motors, Ltd., for a 3-ton motor lorry at £682 and of Dennis Bros., Ltd., for a 30-cwt. motor lorry at £345.

MANCHESTER TRANSPORT COMMITTEE has placed a contract with Crossley Motors, Ltd., for the supply of 30 double-deck omnibuses to supplement the 53 circular route service and to provide an omnibus service in place of the Bradford Road tramways.

THE WESTERN WELSH OMNIBUS CO. has taken delivery of twenty-two single-deck omnibuses from Guy Motors, Ltd., of Wolverhampton, for service in South Wales. This order, it is stated, was placed as a result of the satisfactory working of Guy omnibuses by this company for some years.

THE DAIMLER CO., LTD., has an order from Lanarkshire Traction Co. for 50 CF6 single-deck saloon omnibuses. The bodies will be supplied by the Hoyal Body Corporation, Ltd. The vehicles will be put into service during July, and will be used on services totalling between 3½ to 4 million miles per annum.

THE ENGLISH ELECTRIC CO. recently supplied 20 double-deck petrol omnibus bodies to Nottingham Corporation. A number of the bodies were fitted with a special centre entrance, which has proved a great success in facilitating quick loading and unloading. The design has been patented by the English Electric Co., Preston.

GUY MOTORS, LTD., have received the following repeat orders: Derby Corporation, six "Invincible" 50-seat double-deck omnibus chassis; Reading Corporation, two 26-seat single-deck omnibuses; Sheffield Corporation, 30-cwt. sweeper loader vehicle. The firm have delivered to the Londonderry and Lough Swilly Railway a "Conquest" omnibus fitted with a Guy patent six-cylinder 50-85 H.P. engine.

CROYDON HIGHWAYS COMMITTEE has recommended, as a trial, that a mechanical shovel, fitted to an English tractor, at a cost of £475, be purchased from the Rushton Tractor Company, for the purpose of loading various materials into transport vehicles at the depots. By this means it is hoped to save time and avoid the disorganisation of work which occurs by having to draw men from other work to load vehicles at the depots.

LEEDS TRAMWAYS COMMITTEE has accepted the following tenders:—Charles H. Roe, Ltd., six double-deck top-covered omnibus bodies; Christopher Dodson, Ltd., six double-deck top-covered motor omnibus bodies; Dennis Bros., Ltd., five four-wheel double-deck top-covered motor omnibus chassis; Crossley Motors, Ltd., five four-wheel double-deck top-covered motor omnibus chassis; Leyland Motors, Ltd., two four-wheel double-deck top-covered motor omnibus chassis.

JOHN I. THORNYCROFT & CO., LTD., have recently received orders for motor vehicles from a number of American railways, and for 53 rigid six-wheel chassis from the Indian Government. The London & North-Eastern Railway has ordered 43 motor vehicles. The Bolivar Railways have been experimenting with the use of Thornycroft lorries as feeders to railway services, and have reported successful results. Orders for passenger vehicles have been placed by the Midland General Omnibus Co., Mitcham Motor Co., Surrey; Queen 'Bus Services, Hants; Venture, Ltd., Basingstoke; and Wolverhampton Motor Services. Chassis, including rigid six-wheelers, have been shipped to North China, Uruguay, Johannesburg, Rio de Janeiro, Buenos Aires, and to Norway for the Norwegian Army.

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# OMNIBUS AND COACH SECTION

## AMERICAN OMNIBUS REGULATION.

LEGISLATION PROPOSED TO CONTROL INTER-STATE SERVICES.

A Bill was recently introduced into the United States Congress to effect the regulation of inter-state passenger omnibus services. Although operators of public passenger services, the routes of which lie entirely within the boundaries of the various states, have been for some years strictly controlled by the state authorities acting through commissions, inter-state running has been uncontrolled. Two evils have resulted. The number of operators running inter-state services has increased, so that competition is in some localities intense. Opportunity has been afforded to the less scrupulous operators of inter-state services to avoid the regulations to which they should be subject, by running a few miles over the boundary line and thus claiming to be inter-state operators. A Bill was introduced in the last session of the Congress to provide for the regulation of the inter-state services, but was thrown out mainly on the ground that it would have tended to restrict the free development of the manufacturing side of the transport industry.

The motor vehicles to which the proposed legislation is to apply are defined as excluding any vehicle, locomotive, or car operated on a rail or rails, or motor vehicles used exclusively for the transport of property. Omnibuses exclusively employed for the conveyance of school children and teachers, or operated by or for hotels solely for the convenience of the hotel customers, are also excluded from the operation of the Bill, as also are taxicabs with a capacity of six persons or less.

METHOD OF ADMINISTRATION.

Under the term "motor carrier" are included any carrier of passengers who holds out, announces or advertises the operation of motor vehicles in inter-state commerce for compensation, and any carrier who operates over streets, highways or public places in inter-state commerce and accepts and discharges such persons as may offer themselves for transport either at a terminus or at points along the route over which the vehicle runs. This provision is interesting in that it appears to eliminate any confusion which might otherwise occur through a vague definition of what constitutes plying for hire.

The existing Inter-State Commerce Commission is charged with the administration of the Act and with the making of rules or regulations under the Act. With certain reservations the duties of the Commission are to be delegated to joint boards composed of representatives of the boards of the several states through which any part of the inter-state operation is or is proposed to be conducted. Each interested state is to have one representative on the joint board. Failing the appointment of a representative of a state the joint board is to act without such representative. Should no state appoint representatives, the Commission is to hear and decide the matter for which the joint board was summoned.

The effective section of the Bill provides that no corporation or person shall engage as a motor carrier in inter-state commerce without having first obtained from the Commission a certificate of public convenience and necessity. To this there are two exceptions. Motor carriers operating on the date of approval of the Bill will have ninety days in which to apply for certificates, during which period they will be allowed to continue in operation. Motor carriers in operation on November 1, 1928, who have continued in operation since, on application for certificates will be served by the Commission with a questionnaire to be answered within ninety days. If from the answers to the questions or otherwise, the Commission is satisfied as to the bonâ fides of the operator, a certificate will be granted as a matter of course. Should the Commission not be satisfied, the case is to be referred to a joint board.

CERTIFICATES MAY BE SUSPENDED OR REVOKED.

With the two exceptions mentioned, all persons desiring certificates are to make application, verified under oath. Such applications will be considered by the joint board and the applicant heard. The joint board is to give reasonable consideration to the convenience of and the necessity to the public of the service in respect of which the certificate is desired, and to existing available transport agencies. Such reasonable conditions may be attached to the issue of the certificate as the board may require. The route or routes and the terminal points, if any, are to be specified. On the complaint of any state board a certificate may be suspended or revoked wholly or in part, after investigation by the joint board, for failure to comply with the Act or rules made under the Act. It is provided that certificates may be transferred subject to compliance with such rules as the Commission may make.

In view of the proposals that have been made recently in Great Britain regarding the compulsory insurance of operators and motorists against third party risks, the following section of the Bill, which is given in full, has a certain interest.

> Section 8.—No certificate shall be issued or remain in force unless the holder thereof shall comply with such rules and regulations of the Commission as it shall adopt governing the filing of bonds, policies of insurance or such security or agreement in such form and adequate amount and conditioned as the Commission may require for the payment of any final judgment which may be rendered against any such motor carrier arising out of the death of or injury to any passenger or injury to other persons or property as a result of any negligent operation of the motor vehicles of such motor carrier, with power in the Commission to permit self-insurance whenever, in its opinion, the financial stability of the motor carrier warrants."

All rates, fares and charges are to be just and reasonable. Tariffs are to be filed with the Commission and exhibited as the Commission may direct. No variation of the tariff, in favour of or against particular persons, is permitted, except that the operator may allow persons employed by him to travel free or at reduced fares. Thirty days' notice of change of tariff must be given, such notice to be filed and exhibited in the same way as the tariff.

Aqpeals from the decisions of joint boards may be heard by the Commission, with such rights of appeal from the Commission's findings as now apply to other decisions of the Commission.

The penalties for contravention of the act, or of orders of the Commission, are severe. The Bill is not intended to affect the right of the states to regulate motor carriers engaged in inter-state traffic.

THE BILL TEMPORARILY DROPPED.

By a vote of 219 to 115 the House of Representatives passed the Bill with a number of amendments, and the measure was sent to the Senate. Subsequently the announcement was made that it had not been included in the programme for the session. *Bus Transportation* (New York) has since stated that operators care little whether the Bill passes, and that it offers only a small measure of inter-state regulation. In the Senate Committee the Bill was modified so as to provide for issuance of competitive operating certificates. Lack of competition on any route is thus deemed to be sufficient evidence for the granting of a certificate to another operator. Protest was made to Senator Couzens, chairman of the committee, that this amendment would enable a new line with unlimited capital to displace an established service. While conceding that there are certain objections to the competitive operation authorised in the Bill, the Committee decided that the travelling public would be better protected than would be the case under the monopolistic provisions adopted by the House of Representatives.

A minority of the Senate Committee desires to go even further and to strike out from the Bill all reference to the issuance of certificates of public convenience and necessity. In the opinion of these members the only regulations necessary are those that would require operators of inter-state omnibuses to certify their financial responsibility. The Senate Committee also amended the provisions added by the House excepting omnibus company amalgamations and mergers under the Clayton Act.

A section was inserted to prevent rail carriers from effecting amalgamations through the media of omnibus companies under this special provision. This section also forbids railroads from acquiring any inter-state omnibus lines. Senator Couzens does not believe that the term "railroad" applies to street railways or to most of the inter-state electric lines. It has been brought to the Committee's attention, however, that the Bill would be made clearer if specific definition were given to what is meant by "rail-road."

When the measure comes up for consideration the following four amendments will be proposed by Senator Bratton: That drivers shall work only eight consecutive hours in every 24; that at least two drivers shall be on duty on omnibuses of 20 or more passenger capacity; that companies shall keep a trip record of passengers including names and addresses; that permits shall not be issued or remain in force unless the owner complies with rules and regulations of the Inter-state Commerce Commission with regard to surety bonds or insurance policies.

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# OMNIBUS AND COACH SECTION

## OMNIBUS AND COACH SERVICES.

### MUNICIPAL.

EDINBURGH MUNICIPAL COACHES.—A large number of "Dictator" coaches is being added to the fleet operated by Edinburgh Corporation Transport Department.

SALESMANSHIP TALKS TO EMPLOYEES.—Middlesbrough Tramways Committee is to arrange for lectures on salesmanship to be given to the conductors and drivers of their omnibuses.

NEW GARAGE FOR BURY.—The sanction of the Ministry of Transport to borrow money for the erection of an omnibus garage, estimated to cost £7,500, has been received by Bury Tramways Committee.

DUNDEE CONDUCTORS TO BE LICENSED.—The Transport Committee of Dundee Town Council has decided that all omnibus conductors in the Transport Department shall be licensed, the age limit for such employment to be 18.

TO A NOTTINGHAM HOUSING ESTATE.—The omnibus service lately inaugurated from Trinity Square, Nottingham, to the Aspley estate has proved successful. During peak load periods it is run four times an hour, and before long it is expected that the service will be every fifteen minutes.

L.M.S. CO-OPERATION WITH HUDDERSFIELD.—The town clerk of Huddersfield has reported that the agreement for the sale of one-half interest in the Corporation omnibus undertaking to the London, Midland and Scottish Railway Co. has been completed, and the purchase money paid.

ROUTES AND FARES AT HULL.—A sub-committee of Hull Tramways Committee has been appointed to inquire into the increased omnibus routes and present fares. A net profit last year of £9,503 was regarded as unsatisfactory, and it would have been only £2,000 but for lower rates due to a reduction in the assessment.

THREAT OF AN INJUNCTION AT YORK.—At a meeting of York Corporation on July 7, Alderman W. Dobbie (chairman of the Transport Committee) announced that the Committee had withdrawn a proposal to run the omnibuses with private parties to places outside the city, owing to a threat of an application for an injunction.

SOUTHPORT ENTERPRISE.—During the past year the Southport Corporation's omnibus department added two "Titan" double-deck omnibuses to the fleet, thus increasing the capital outlay to £15,174. The net capital indebtedness is £7,049. The garage adjoining the tramways depot is expected to be completed by the contractors before the end of the summer.

PROPOSED CENTRAL STATION FOR MANCHESTER.—The question of providing an omnibus station in a central position of the city has been under the consideration of the Manchester Transport Committee. The matter of a site is being further considered, and further action may be anticipated when the committee receive a report from the general manager as to alternative sites.

WIGAN'S TRANSPORT POLICY.—Alderman Santus, chairman of Wigan Tramways Committee, announced at a meeting of the Council that a comprehensive report on the town's transport is being prepared, and when it is completed the Committee hope to present a definite policy for the new transport system. The corporation is negotiating with local authorities in the district to obtain support for proposals to operate trolleybuses.

NEW SERVICES FOR BIRMINGHAM.—The Tramways Department is about to institute new omnibus routes from Warren Farm to Castle Bromwich Station, King's Norton to Yardley Wood via Alcester Lanes End, and the city to Gospel Lane and Warren Farm housing estates. With the omnibuses at present on order the Committee hope at the end of July to provide a service of omnibuses in place of the Hagley Road tramways.

A FURTHER CONVERSION AT MANCHESTER.—It is proposed to replace the Bradford Road tramways by motor omnibuses. The track is 27 years old and needs renewing. As nearly a mile of the 3½ miles of track comprises single line and loops, Mr. Stuart Pilcher, the general manager, advises that a more efficient service could be provided by omnibuses. To provide such a service and also to cater for the increased traffic developed by omnibuses on the abandoned No. 53 tramways route, the Corporation have placed an order for 30 double-deck omnibuses with Crossley Motors, Ltd.

DURBAN CORPORATION TOURS.—A booklet issued by Mr. J. A. Bromley, general manager and engineer of Durban Corporation Tramways and Motors, describes a number of tours in and around this South African health resort. There are morning, afternoon, evening and all-day tours by omnibus-de-luxe and open promenade runabouts, the latter for taking parties of visitors to see the many attractions of the borough. During the past year the omnibus fleet has increased by 100 per cent., the vehicles being of the latest enclosed type, well sprung and luxuriously fitted.

OMNIBUS WEIGHT REGULATION.—Aberdeen Tramways Department recently decided to run double-deck omnibuses on certain routes, and an application was made for a licence. The chief constable objected on the ground that the vehicle was over the regulation weight. The vehicle weighed 9 ton 4 cwt. Mr. J. L. Gunn, the tramways manager, said he was afraid the police were not up to date with the regulations. He produced regulations from the Ministry of Transport issued on June 1 which indicated that the permitted weight was 9 tons 10 cwt. The licence was granted.

GLASGOW TRANSPORT DEVELOPMENTS.—The last contract for 100 double-deck omnibuses placed by Glasgow Corporation is now practically completed. The Corporation will soon have 230 omnibuses in service, and they have invited tenders for 50 to 100 double-deck omnibuses, the tenders to be received by July 29. The management anticipate, it is said, that from 400 to 500 omnibuses will eventually be needed. Work on the extension of Larkfield garage is proceeding, and it is anticipated that the building will be ready for occupation before the end of the year. The extension will provide for another 100 omnibuses. Inquiries are being made regarding sites for the erection of other garages.

MINISTRY OF TRANSPORT AND EXPRESS SERVICES.—When the Walsall Corporation Bill came before the Local Legislation Committee of the House of Commons on June 25, exception was taken by the Ministry of Transport to a clause giving powers to run express omnibus services without obligation to stop and pick up short-distance passengers For the Corporation it was urged that the powers were urgently needed, and that the Road Bill would give the Area Commissioners power to sanction such services. The Committee passed the clause with a proviso retaining for the Corporation the powers they possess under the Act of 1914 with regard to the running of through services, but without prejudice to any of the general powers of the Road Traffic Bill which might conflict with those powers. The Bill was ordered for report and third reading.

A YEAR'S PROGRESS AT MANCHESTER.—On a total revenue of £271,359, the motor omnibuses of Manchester Corporation are credited with a gross profit of £61,214 for the year ended March 31 last. On that date there were 190 omnibuses in stock, and others on order. The receipts equalled 13.675d. per omnibus mile, the working expenses being 11.166d. Including capital charges and provision for renewals the total working expenses were 13.444d. The length of route operated at March 31 was 210 miles, including 97 miles outside the tramway area. At March 31 the capital expenditure on omnibuses, garages and machinery totalled £469,438. During the year eleven bodies were built at the Hyde Road car works. The Princess Road garage was opened on April 15, 1930, providing accommodation for sixty omnibuses. The cost was £32,000. Substitution of omnibuses for tramcars was effected on No. 53 route, one of the busiest in the city. The average fare per mile on the Manchester omnibuses is 1.113d., the average distance travelled for one penny being .898 mile. On the tramways the figures are .635d. and 1.574 miles respectively.

BLACKBURN'S NEED OF A LARGER AREA.—In reporting on the results of five months' working of omnibuses by Blackburn Corporation during the second half of the year ended March 31 last, Mr. J. H. Cowell, general manager, expresses the opinion that little can be done by the omnibuses in a profitable direction until the Corporation is operating over a larger area. The only outside service was with Accrington, which brought Blackburn £2,254 for 32,957 miles run, the number of passengers being 105,120 the receipts being at the rate of 16.41d. per omnibus mile. The general manager states that if Blackburn had received proportionate share of the receipts according to its mileage there would have been no loss on the omnibus undertaking. The seven services produced £7,254 for 132,147 miles run, this sum being insufficient by £488 to meet the working expenses. There are twelve omnibuses —six Leyland "Tiger" and six Leyland "Titan." Petrol consumption totalled 26,180 gallons, which works out at 5.05 miles per gallon, and 2.85d. per mile. Since the services began the price of petrol has fallen from 1s. 4½d. per gallon to 1s. 1½d.

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# OMNIBUS AND COACH SECTION

### COMPANY.

A New Ribble Depot.—Premises have been purchased in Lowther Street, Carlisle, for use as a depot by the Ribble Motor Services, Ltd.

New Thames Valley Express Venture.—Twelve services in each direction on week days and five on Sundays are being run between Oxford Circus and Walton-on-Thames by Spartan Coaches of Acton.

Increased London-Windsor Rivalry.—Highways, Ltd., have brought their half-hourly service between Regent Street and Windsor into line with the 15 minutes' services of the London General Omnibus Co. and the Premier Omnibus Co.

Garage for Greenock.—Greenock Corporation has accepted the offer of Greenock Motor Services Co. of £5,000 for a piece of land on which to build an omnibus garage. Besides the garage, spacious offices and a waiting room for the public will be built.

Wireless for Chicago Omnibuses.—Chicago newspapers state that six double-deck omnibuses have been equipped with wireless sets to test the advisability of their use in omnibuses and coaches. The officials of the companies consider that reception has been satisfactory, and apparently it is the intention of the proprietors to provide their passengers with a broadcast service.

Fares Applications.—An application by the L.M.S. Railway Co. to increase the passenger fare on the company's omnibus service between Belfast and Ballyclare from 5s. to 6s. was refused by the Northern Ireland Transport Fares Tribunal. A request to increase the weekly season ticket fares between Belfast and Kilroot was granted, also to adjust the fares on the Larne-Cushendall services.

Newcastle-South Shields-Jarrow Services.—The Northern General Transport Co. has taken over the omnibuses and licences of the L.N.E. Railway and the Jarrow and District Traction Co. for the services from South Shields to Newcastle and to Jarrow and Hebburn. In agreement with the chief constable of South Shields the speed of the South Shields-Newcastle service has been reduced.

Co-ordination in Yorkshire.—Mr. W. S. Wreathall, deputy-chairman of the Yorkshire (Woollen District) Electric Tramways, presiding at the annual meeting, stated that the two railway companies had acquired a joint interest in the company equal to that of the British Electric Traction Co. A working agreement for co-ordination of railway and road interests had been entered into. Receipts from the company's omnibuses increased during the past year, but more miles had to be run to take the same money.

Licences at Greenock.—Seventeen licences for omnibuses to run between Gourock and Largs and seventy for services between Greenock and Glasgow have been granted by Greenock Licensing Court. The licences were granted as follow: A. J. Doig, 2; J. Dunlop, 2; A. Pyefinch, 3; R. Muirhead & Sons (Stanley), 12; R. and W. Ferguson, 22; L.M.S. (Largs), 10; Scottish General Transport Co., 14; Greenock Motor Services and L.M.S., 22; Greenock Motor Services, 56; and Port-Glasgow Motor Co., 14.

Bath-Bristol Service.—Bristol Tramways and Carriage Co. have increased their omnibus service between Bath and Bristol. The 15-minute service is continued on week-days until 1.20 p.m. and thereafter every 10 minutes until 11 p.m. On Sunday there is a 10-minute service from 1.50 p.m. until 10 p.m. This service was begun in April, 1928, when omnibuses ran every half-hour until October of that year, when a 15-minute service was introduced at certain times. The journey is 45 minutes and 84 omnibuses are run per day in each direction. The service from Bath to Blagdon and Weston-super-Mare has also been increased.

Competition with Buenos Aires Tramways.—It was stated at the 46th annual meeting of the Anglo-Argentine Tramways Co., on July 1, that in 1929 the number of omnibuses in Buenos Aires had increased from 600 to more than one thousand. The increase was mostly outside the central zone, which was due to restrictions widely introduced in 1928. It was hoped that the taxicabs would soon be the object of some official regulation to render their competition fair and less harmful to the older and more vital services. The company is now preparing a scheme for submission to the Municipal council for a complete reorganisation of urban transport.

### LONG-DISTANCE.

A New Glasgow-Manchester Service.—Six new Crossley coaches are being used by the Majestic Saloon Coaches for a day and night service lately inaugurated between Glasgow and Manchester. Connection is given with the company's Manchester-London service.

L.N.E.R. Reply to Competition.—In order to meet the low coach fare between Newcastle and London, the L.N.E.R. Co. is issuing a 35s. 6d. return ticket by ordinary trains on Mondays, Tuesdays and Wednesday, available for return any day. Road coach fares are 20s. single and 35s. return, but only 30s. for a six-day return.

Glasgow-London Service By a Railway Ally.—A daily Glasgow-London service in each direction has been started by the Midland Bus Co., of Glasgow, at 30s. single and 50s. return. The company is one of the Scottish Motor Traction group, with which the railway companies are allied. The London office is at Grand Buildings, Trafalgar Square.

Scottish Express Services from Liverpool.—From Dale Street omnibus station and Mount Pleasant the Ribble Co. run two morning services each day to Carlisle, Glasgow and Paisley. Nine express services a day are being operated to St. Annes and Blackpool. There are seven services daily to Morecambe and Kendal, with connections to the Lake district.

New Glasgow-London Venture.—National Coachways, Ltd., a new undertaking, has taken on the London-Glasgow service formerly run by Cestrian Coaches, of Chester-le-Street. The latter undertaking is now working between Tees-side and London. Mr. J. Glenton Friars, of Blaydon, well known for road services that bear his name, is one of the promotors of National Coachways.

London Coastal Coaches Development.—The organisation which for several years has represented coach owners in the southern counties, and provided London with its first large coaching station, at Lupus Street, Victoria, is now meeting competition by advertising day and period excursions to all parts. The latest type coaches are used by the associated companies. Inclusive tours throughout Great Britain are offered.

Bristol Travel Bureau.—The Bristol Tramways and Carriage Co., Ltd., have established a road travel bureau at Princes Street, Bristol. In pleasant rooms in the company's newly-erected building passengers can wait for connections and secure refreshments. The ground floor is used as a booking office and waiting-room. On the second floor there is a café with kitchen and service equipment. On the top floor there is a smoking-room.

Joint Services from Sheffield.—Licences have been granted by Sheffield Watch Committee to the L.M.S. and L.N.E. Railways to co-operate in the Leeds-Sheffield service of the Yorkshire Traction and West Riding Automobile Companies. Other licences include the following: Sheffield to Rotherham, Sheffield Corporation and Railways Joint Committee; Sheffield to Treeton, Joint Committee; Sheffield to Nottingham, L.M.S. and L.N.E.R.; Harrogate to Birmingham and London, West Yorkshire Road Car, Yorkshire Electric Tramways and Yorkshire Traction Co.

Definition of Long-Distance Service.—South Shields Watch Committee has decided that any omnibus service operating outside a radius of 20 miles from the starting place within the borough should be scheduled a long-distance service. In addition to the Ministry of Transport vehicular regulations the following conditions are to be attached to licences:—A minimum fare of 2s. for each passenger boarding the omnibus within the borough; no passenger to be picked up and set down within the borough; the vehicles to be subject to the approval of the chief constable; vehicles to stop only at places approved by the chief constable, and to be used only for a recognised long-distance service.

Leeds-Huddersfield Inquiry.—A Ministry of Transport inquiry was held at Leeds on June 23 into the refusal of Leeds and Huddersfield Corporations to grant ten licences to ply for hire to Armitage & Co., who run services thrice daily from those towns to Blackpool. Mr. Proctor (town clerk of Huddersfield), said the Corporation was bombarded with applications in connection with through services throughout the north of England, and was of opinion that the present was not the time to grant licences as there was a Road Traffic Bill before Parliament. Long-distance services should be regulated and co-ordinated by the proposed Area Commissioners. Mr. J. R. Hill, a member of Blackpool Council, said the Watch and Transport Committees were surprised that licences had been refused. The deputy town clerk of Leeds said his corporation considered the services unnecessary, and the Leeds chief constable gave evidence that the route suggested was unsuitable.

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# OMNIBUS AND COACH SECTION

## MOTOR TRAFFIC NOTES.

RUMANIAN ROAD SCHEME.—Stewart and Partners, of London are reported by Reuter to have secured a contract for the construction of 250 miles of first-class roads in Rumania, at a cost of more than £2,000,000.

USE OF EXHAUST GASES FOR HEATING.—New regulations imposed in New York State decree that exhaust gases used for heating motor vehicles must not pass through appliances within the body of the omnibus or coach.

MOTOR SPIRIT FROM AUSTRALIAN COAL.—It is reported that in accordance with an agreement between the Standard Oil Co., the German Dye Trust and the Imperial Chemical Industries, the Maitland coal field in Australia is to be exploited for the extraction of motor spirit from coal.

THE UNIFORM OF TRAFFIC POLICE.—The Commissioner of Police for London reports that experience has shown that policemen clothed in all-white garments are not more visible than those with only white gauntlets, and that white overcoats, therefore, are not to be adopted for general use.

CONVEYANCE OF MAILS IN LONDON.—All the Post Office mails in London are in future to be conveyed in motor vans. Several contractors have for years utilised motor vehicles. Early in July James Allen, Ltd., of Seward Street, E.C., disposed of nearly four hundred horses which had drawn mail vans.

£12,000,000 MORE FOR ROADS.—At an interview with representatives of local authorities on June 25 the Minister of Transport stated that the Government will extend the grants for trunk road improvements and reconstruction so that the total expenditure may be £21,000,000, instead of the £9,000,000 limit fixed last July.

SWEDEN'S CAR IMPORTS.—The British commercial counsellor at Stockholm reports that out of 12,800 motor cars imported into Sweden in 1928, Great Britain's share was 145. Swedes prefer a car with plenty of power, and have become accustomed to American cars. The report adds that the difficulties are not insuperable for British firms.

NEW SAFETY SUGGESTIONS.—Among the suggestions put forward at a meeting of the London Safety First Couucil were that stationary vehicles show two red rear lights, that lighting-up time be advanced 30 minutes, safety glass be adopted for omnibuses and tramcars, and that tramcar drivers should give warning where they are going to stop.

NORTH-EAST COAST REGIONAL COMMITTEE.—An Advisory Committee on Traffic, with Councillor P. McArdle, of Wallsend, as chairman, has been formed for the North-East Coast. Its functions will include the making of representations with the object of eliminating overlapping and unnecessary services, co-ordinating services, and ensuring better control.

CONTROL OF COACHES IN LONDON.—The Ministry of Transport has informed the House of Commons that he has no power to restrict the entry of motor coaches into central London if they do not ply for hire in the Metropolitan police district. It would be possible, however, to exercise control over these vehicles if the relevant provisions of the Road Traffic Bill become law.

UNILATERAL TRAFFIC SIGNS.—In certain streets in Derby the Automobile Association has erected unilateral traffic signs. These signs regulate vehicles for taking up or setting down passengers or remaining for a short period on one side of the road only on one day, and on the opposite side the following day. The system is to be adopted in narrow streets in the City of London.

NEW ZEALAND RAILWAYS AND ROAD SERVICES.—In order to meet the competition from road services the New Zealand Government Railways have been operating road motor vehicles and purchasing established services. A report is being prepared as to whether existing services can best be supplied by road vehicles, trains, or rail-cars, and in the event of the last mentioned being favoured, the most suitable type.

PROPOSED DEVONPORT-TORPOINT BRIDGE.—It is proposed to construct a bridge over the river Tamar, at Plymouth, as a link in the trunk road between London and Land's End. The estimated cost is £1,250,000. The Ministry of Transport is prepared to bear 75 per cent of the cost. There are often long queues of cars, coaches, and other vehicles awaiting their turn at the ferry crossing provided by Cornwall County Council.

FIRST AID IN ROAD ACCIDENTS.—In their annual report the Joint Council of the Order of St. John and the British Red Cross say that first-aid boxes have been set up by hundreds on the roadside. First-aid huts are also springing up about the country, X-ray cars are becoming increasingly valuable to medical men in accident and illness cases. With the powerful generating plant on the car, results can be obtained equal to those at hospitals.

SPEEDWAY SCHEME FOR THE WASH.—The Lords Commissioners of the Treasury are prepared, it is stated, to make a grant of tidal lands to facilitate the scheme of the Automobile Racing Association to construct a speedway for the Wash. The track will be of concrete 200 yards wide, and will be straight for over fourteen miles. It could be completed within two years. Combined with the scheme is the provision of a winding track that would be suitable for races of the Tourist Trophy type.

SLOW-MOVING VEHICLES IN LONDON.—In reply to a Parliamentary question on July 7, the Minister of Transport stated that the London Traffic Advisory Committee think it would be undesirable at present to restrict the use of horse-drawn vehicles as distinct from other slow-moving traffic. It was proposed to ascertain from an analysis of traffic to what extent slow-moving vehicles or any class of vehicles interfere with the working of the automatic control system about to be installed in Oxford Street.

MARKING INQUIRY INTO MOTOR VEHICLES, ETC.—The Standing Committee appointed by the Board of Trade under the Merchandise Marks Act, 1926, has postponed to September or October the inquiry which was to have been held on July 7 as to whether the following classes of imported goods should be required to bear an indication of origin: Motor cars, vans, lorries, chassis and bodies; internal combustion engines of all descriptions, driven by spirit; chassis parts; magnetos, batteries and ignition plugs.

CLASSIFICATION OF STREET ACCIDENTS.—Sir George Hume, chairman of the Special Committee on Traffic, in reply to questions at a meeting ot the London County Council, on July 1, said it was difficult to devise a satisfactory classification for street accidents. The Ministry of Transport was now investigating accident statistics. The statistics on fatal accidents submitted to the Royal Commission on Transport showed that 35.1 per cent. were attributed to the motor driver or motor cyclist, 35.4 to the fault of the pedestrian, and 15.1 to excessive speed.

L.N.E. RAILWAY BRANCH LINES BEING CLOSED.—Passenger services on old branch lines of the L.N.E.R. in Northumberland are to be discontinued, as well as from twelve stations between York and Scarborough on September 22. Goods trains services will be maintained, but the passenger trains are being stopped because fewer passengers are using them. The Northumberland branches to be closed are those between Hexham and Allendale, twelve miles long and serving four stations, and between Alnwick and Cornhill, thirty-five miles of line with ten stations.

NEW CONDITIONS FOR LONDON COACH LICENSING.—Coaches presented for licensing in the Metropolitan police district for the first time after July 1 last must have adjustable windscreens fitted with an approved form of safety glass, an approved mechanical wiper, and side guards between the front and rear wheels on all coaches not provided with running boards. A minimum ground clearance of 4 in. must be maintained when fully loaded. The requirement as to windscreens will not be insisted upon in respect. of vehicles already licensed or approved for licensing on July 1 last

## NEW OMNIBUS CHASSIS.

NEW A.E.C. PASSENGER MODEL.—An addition to the range of passenger vehicles made by the Associated Equipment Co., Southall, is known as the "Ranger." It has been introduced in order to meet the demand for a single-deck high-power omnibus or coach of the driver-behind-engine type. Apart from the drive, the vehicle is similar to the "Regal" single-deck chassis, and will embody the minor improvements which have been effected in that model.

A NEW OMNIBUS CHASSIS BY DENNIS BROS.—A six-cylinder engine developing 100 B.H.P. is a feature of a new chassis introduced by Dennis Bros., Ltd., for double-deck bodies. It is named the "Lance" and has a wheel-base of 16 ft. 6 in., the overall length being 25 ft. 4 in. To secure a low-loading line the power unit and transmission are offset.

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LONDON, JULY 19, 1930.

## BRADFORD TROLLEYBUS SCHEME.

The decision of Bradford Corporation to replace their tramways with trolleybuses when the tracks need reconstruction, and the unanimous assent given by a Select Committee of the House of Commons to the Corporation Bill promoted for that purpose, marks a stage in the progress of railless traction. Including new routes, Bradford and its environs will eventually have about forty such services, many extending into the county area. Where such routes will supersede single line tramways a particularly marked improvement in service will result, and in this connection it is worth while reminding other tramway authorities of a suggestion which was put forward by Mr. R. H. Wilkinson, the Bradford manager, in the paper which he read before the Institute of Transport in February last. In the trolleybus, said Mr. Wilkinson, tramway authorities, particularly those whose rails meet but are unable to interrun owing to difference of gauge, have an instrument that is capable of giving the most efficient and economical service between towns on which they could have protective fares. In many cases licences would not have been granted to omnibus operators if a through service of vehicles had existed, and the trolleybus can provide such a service. When the Bradford project has been completed the sum of £494,571 will have been spent, as against £916,000 that would have been required to relay the thirty-five tramways. It is gratifying to note that the Select Committee relieved the Corporation of a road restoration burden which the County Council proposed to impose beyond the legal obligation. The Council failed to substantiate a claim that Bradford should pay the difference between the legal obligation and present-day standards of construction, a requirement that would have involved an extra cost of £20,000. Bradford's experience on this point should be borne in mind by municipal and company undertakings that may be proposing a change-over. Mr. Wilkinson's success in securing the assent of the Corporation to his plans comes at a time when the finances of the city's transport need the lower cost of operation ascribed to the trolleybus. The general manager, too, is no novice in its operation, for he has already 57 such vehicles in commission, compared with 240 tramcars and 90 petrol omnibuses. As he informed the Institute of Transport, modern design and efficient pneumatic tyres have given the trolleybus an assured place, and have made it the most serious rival of the tramcar for all kinds of town traffic. To Mr. Wilkinson the present-day railless car, so comfortable and so smooth and quiet in running, may be said to owe its existence. In 1921 and 1922 he built in the department's workshops two six-wheel vehicles, which were described and illustrated in THE TRAMWAY AND RAILWAY WORLD. It was the building of these cars and their subsequent performance in service which gave a fresh impetus to this form of transport.

## GLASGOW'S APPLICATION FOR PROTECTION.

Lord Meston presided over a Select Committee of the House of Lords that on Tuesday last began consideration of the Glasgow Corporation Bill, which was opposed by the Omnibus Owners' Association, the Society of Motor Manufacturers and Traders, and Rutherglen and Renfrew Councils. The Bill had already passed the House of Commons.

Sir Lynden Macassey, K.C., for the Corporation, said their object was to obtain some form of rationalisation of road passenger traffic so as to secure the best efficiency. The motor omnibus had seriously affected the tramways, and the Corporation were seeking that form of protection which was now a familiar feature of Bills such as this one. Competition between omnibuses and the Corporation tramways had developed until it was a menace to the prosperity of the tramways, and had created serious congestion. By an Act passed last year the Magistrates' Committee, which was responsible for the issuing of omnibus licences, were given additional powers, and they now imposed as a condition of the licences that no omnibus should pick up and set down the same passenger within the city along a tramway route.

Mr. Graham Robertson said that was true, but it was also true that omnibus proprietors were challenging the right of the Magistrates' Committee in the Courts, and were meantime refusing to comply with those conditions.

Sir Lynden Macassey added that the Corporation were seeking power to run omnibuses on any of the tramways in order that, if and when they decided to abandon any section when worn out, they could continue a service of omnibuses in their place. They were seeking protection from indiscriminate competition on those routes by asking for conditions to be attached to the licences. As long as they provided an adequate service, the Corporation were asking that no other local authority or company or person shall run omnibuses within the city or in Renfrew or Rutherglen along any protected route or competitive route. That was opposed by omnibus companies, and also by local authorities who wanted the right to veto proposed routes in their areas. Exemption from the clause had been granted to the railway companies and Lanarkshire Traction Co. An appeal to the Minister of Transport would be allowed as to whether a route was competitive, whether an adequate service was being provided, or on any conditions attached to a licence.

On Wednesday Coun. P. J. Dollan, chairman of the Transport Committee, gave evidence in support of counsel's statement. In reply to the Earl of Lauderdale, he added that omnibuses which ran to Aberdeen and London picked up and set down short-distance passengers in the city. In slack periods they went to the Corporation housing estates and competed with the Corporation vehicles. It was impossible, according to the chief constable, to see that owners carried out the condition on their licences that they must charge a higher fare.

### MR. MACKINNON ON OMNIBUS COMPETITION.

On Thursday Mr. L. Mackinnon, general manager of the Corporation transport, gave evidence in detail of the scope of the undertaking. Since 1924 there had been a constant diminution of the tramways revenue corresponding with the growth of competing privately-owned omnibuses. In 1920 there were only ten of these omnibuses, but in April of this year there were 1,410, and the latest figures showed 1,589, this including the omnibuses run by the Corporation. From 1920 to the end of last year there had been a drop in tramway receipts of 5¾d. per car mile, but, on the other hand, they had decreased substantially running costs by improvements in the cars and faster running time. It was not right that in a city like Glasgow there should be indiscriminate competition and the streets flooded with unnecessary vehicles.

In cross-examination Mr. Mackinnon said there was a surplus of £2,700,000 to the credit of the renewals and depreciation fund. He agreed they were not anxious about the financial position, but they had a good deal of track in very poor condition on which large sums would have to be spent.

Mr. Mackinnon's evidence closed the case for the Corporation.

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## L.C.C. TRAMWAY MATTERS.

BETTER FINANCIAL RESULTS FOR 1929-30.

At the meeting of the London County Council on Tuesday the Finance Committee reported that the result of the working of the tramways for the year ended March 31, 1930, was a net surplus of £128,804 as compared with a net deficiency of £6,790 in the previous year. The revenue, debt charges, etc., are as follows :—

| | 1928-29. | 1929-30. |
|---|---|---|
| Total revenue receipts ... ... ... ... | £4,373,944 | £4,460,536 |
| Surplus on revenue account ... ... ... | 688,957 | 847,207 |
| Debt charges and other items on net revenue account | | |
| Debt charges: ... ... ... ... | 740,371 | 758,625 |
| *Less*—Other credit items ... ... ... | 44,624 | 40,222 |
| | 695,747 | 718,403 |
| Balance, net surplus, or net deficiency ... ... | (—) 6,790 | (+) 128,804 |

As compared with 1929 passenger traffic revenue improved by .172d. a car-mile. Ordinary expenses, including renewals and special charges, showed a net decrease of .348d. a car mile. There was a net increase in the gross surplus on working of .517d. a car mile. The Committee remark that the fact that the improved position is the result of increased traffic receipts combined with decreased expenses, is a very satisfactory feature of the accounts.

The net capital expenditure in 1929-30 amounted to £294,907. The total capital expenses to March 31, 1930, were £17,719,198. The total debt incurred amounts to £18,126,719, while the net debt outstanding is £8,300,593.

The Council adopted the recommendation of the Highways and Finance Committees to carry forward the balance instead of applying it to the repayment of obsolete expenditure on horse tramways.

MOTORMEN'S AND CONDUCTORS' MEAL FACILITIES.

The Highways Committee reported on the motion passed at the Council meeting on May 20, as to whether better facilities can be afforded for motormen and conductors to obtain meals while working on the tramcars. The present arrangement with regard to obtaining meals is the result of agreement with the staff concerned, and provides that not less than sixty per cent. of the duties of the platform staff shall be without a break. The effect of this is that within certain rules as to time and place motormen and conductors make their own arrangements as to refreshments. The Committee considered that the provision of a meal relief on straight through duties under the existing agreement would involve considerable expense and inconvenience. Recently a shelter for the use of traffic employees has been erected at Stamford Hill, and arrangements have been made with the Tramways Social and Athletic Association for the supply to motormen and conductors of refreshments which may be consumed on the cars at terminal points. As opportunity offered similar arrangements would be considered for other routes.

## PERSONAL.

**Mr. G. H. Nisbett,** managing director of British Insulated Cables, Ltd., received the honorary degree of Master of Engineering at the University of Liverpool on July 5.

**Mr. Theodore Petersen,** one of the joint managers of Callender's Cable & Construction Co., Ltd., has been appointed assistant managing director with a seat on the board.

**Mr. R. G. Selbie, C.B.E.,** general manager and a director of the Metropolitan Railway, who died on May 17, left estate of the gross value of £67,724, with net personalty of £32,706.

**Mr. W. W. Clark,** who has been resident manager of the Notts and Derby Tramways at Heanor during the past six years, has been presented with a writing bureau by his colleagues. Mr. Clark is leaving to take up a position for the company at Mansfield.

**Mr. G. H. Brookes,** accountant and chief clerk of the L.C.C. Tramways, was appointed to act for the general manager during his vacation, pending the completion of the organisation of the department consequent upon the promotion as from July 1, 1930, of Mr. T. E. Thomas to the position of general manager.

**Mr. A. L. Lunn,** deputy chief engineer, Manchester Corporation Electricity Department, has been appointed to a new position with the Underground Railways Group of London. The duties relate to the generation, distribution and future developments of power for the allied companies. The Manchester undertaking has grown ten times its original size during Mr. Lunn's nineteen years' service in that city.

**Mr. Cyril Dennis,** of Messrs. W. B. Dick & Co., addressed the members of the St. Helen's Rotary Club on July 14 on "Russia of To-day." There was a large attendance, including Alderman Rudd, chairman of the St. Helen's Corporation Tramways Committee. Mr. Dennis has addressed a number of Rotary Clubs on the same subject, and his remarks should go far to create a constructive interest in the problems with which Russia is faced to-day.

We regret to record the death of **Mr. John Edward Waller,** who was until 1924 senior partner in the consulting firm of Messrs. Kincaid, Waller, Manville & Dawson. Mr. Waller was concerned with much electric tramway and railway work during the early period of electric traction in this country.

## MISCELLANEOUS NEWS AND NOTES.

**London Tramway Publicity.**—The L.C.C. Tramways Department has entered into a reciprocal arrangement with the Underground Group as regards publicity.

**New Route at Southampton.**—The opening of a new tramway route along Burgess-road from Bassett to Swaythling, Southampton, on July 10, has made it possible to run cars on the circular route.

**Trolleybus Suggestion at Portsmouth.**—Alderman Sir John Timpson, chairman of Portsmouth Tramways Committee, has expressed the hope that the Council might see their way clear to go into the suggestion of the trolleybus system.

**Omnibuses Replace Tramcars in Lanarkshire.**—This week some of the tramcars operated by the old Lanarkshire Tramways Co. have been withdrawn from certain routes and omnibuses substituted by the newly-formed Lanarkshire Traction Co.

**Path-Finder Machines on the London Tramways.**—The L.C.C. Tramways have accepted a proposal for the installation of path-finder machines in the shelters at Westminster, Blackfriars and Clapham, at nominal rents, subject to conditions.

**Walsall-Wolverhampton Trolleybus Link.**—The joint municipal service of motor omnibuses between Walsall and Wolverhampton having proved satisfactory, the Corporations are now to provide a trolleybus service. It will replace the tramways, and will cost £21,155.

**Additional Plant for Rothesay.**—The Rothesay Tramways Co. have intimated that they are willing to take current from the Council's electrical supply. Additions will be necessary to the plant and the electrical engineer has been instructed to prepare an estimate of the cost.

**The Cost of Living Index.**—On July 1 the average level of retail prices of the commodities taken into account in the statistics compiled by the Ministry of Labour was approximately 55 per cent. above that of July, 1914, as compared with 54 per cent. a month ago, and 61 per cent. a year ago.

**Proposed Sale of Keighley Tramways.**—Keighley Tramways Committee, which has received an offer to buy the tramways undertaking from the West Yorkshire Road Car Co., is waiting for a report from Mr. A. R. Fearnley, general manager of Sheffield Corporation Tramways, who is acting as consultant in the matter.

**Smoking in Bristol Omnibuses.**—The ban on smokers in the omnibuses of the Bristol Tramways Company has been withdrawn. An official recently said that the general experience had been that women, whether smoking or not, would sit in a smoking compartment, and that hardly anyone objected to smoking.

**Buenos Aires Tramcar Falls into a River.**—A tramcar of the Campania Tramways Electricos Del Sud crowded with passengers and travelling from the southern suburbs of Buenos Aires to the city fell into the River Riachuelo on July 12. Of the 70 passengers there were only four survivors. The accident is said to be due to the driver not noticing that the movable section of the bridge was raised.

**A Colchester Transport Prize.**—A tableau arranged by the Corporation Transport Department was awarded first prize in the transport section of Colchester civic week carnival. It comprised the "Times" omnibus of 1850 from the museum of the London General Omnibus Co., and one of the Corporation's fleet of double-deck 95 h.p. "Regent" omnibuses from the Associated Equipment Co.'s works.

**L.C.C. Tramway System.**—Mr. T. E. Thomas, general manager of the London County Council Tramways, speaking at a luncheon at the Clapham Rotary Club, gave some interesting particulars of the tramways. He said that over 700 million passengers were carried in a year. Including 166 miles of route owned by the Council, and 90 miles owned by adjoining authorities, over which the Council's cars ran, the whole system covered 250 miles of street. The average weekly consumption of coal at Greenwich power station was 4,000 tons.

**Edinburgh Transport Magazine.**—The quarterly issue of "Speed," the magazine of the Edinburgh Corporation Transport Department, contains an article on "Seeing Edinburgh by Tramcar and Omnibus." "The Experiences of a Learner" on the conducting side of the department reveal a spirit of helpfulness on the part of the staff and fellow conductors. Congratulations are extended to Mr. H. L. Mittell, assistant engineer, on again winning a prize in the essay competition of the Municipal Tramways and Transport Association.

**Future of Bolton Tramways.**—At the annual inspection of the Bolton transport undertaking on July 9, Councillor Bradley, chairman of the Tramways Committee, said they had routes on which the track would not be relaid, and it was important that they should begin to consider alternative means of transport. For short town distances he considered the trolleybus the most economical and best method, but some of the routes were still best served by the tramcar. He had learned from other tramway authorities that Bolton's department was exceptionally well managed.

**The Automobile Association.**—Mr. C. McWhirter, presiding at the annual meeting of the Automobile Association on July 16, said that the outstanding event had been the Road Traffic Bill. Motorists were hedged round with rules and regulations, they had to submit to excessive fines for nominal offences, and they were even liable to imprisonment for offences not possible exactly to define. The Association would continue to examine the proposed regulations and every case brought by the police. The membership of the Association was now 430,794, and during the year the millionth car badge was issued.

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**Motor Coach Collision in Morocco.**—A Reuter telegram states that a motor car and a motor coach collided on the bridge over the Gorge of the Talagh River near Gueraf in French Morocco. The coach fell into the gorge, six native passengers being killed and twelve others seriously injured.

**New Tramcars for Edinburgh.**—Mr. F. A. Fitzpayne, manager of Edinburgh Corporation Transport, in a report to the Transport Sub-Committee, states that the department is building 88 new tramcar bodies and covering in the vestibule ends of the upper decks of 188 more, at an estimated cost of £100,204. These will not be completed until 1934 or 1935. Mr. Fitzpayne recommends the expenditure of £4,000 on building a special car with all fittings of more modern design which would serve as a guide to the advisability of building others when those now under construction are completed.

**Durban Corporation Omnibus Tours.**—A booklet issued by Mr. J. A. Bromley, general manager and engineer of Durban Corporation Tramways and Motors, describes a number of attractive tours in and around this South African health resort. There are morning, afternoon, evening and all-day tours by omnibus-de-luxe and open promenade runabouts, the latter for taking parties of visitors to see the many attractions of the borough. During the past year the omnibus fleet has increased by 100 per cent., the vehicles being of the latest enclosed type, well sprung and luxuriously fitted.

**Traffic Control Lights at Ludgate-Circus.**—The City of London police on the morning of July 12 inaugurated the control of traffic at Ludgate-circus by light signals. The lights are worked by a constable standing in a "pulpit" on the Farringdon-street refuge. There is a marked speeding up as compared with the previous control by four constables, but two defects are apparent. One is that the lights are not high enough to prevent obscuration by vehicles on the right. Another is that a leading vehicle sometimes advances beyond the steel-marked line on the roadway, the driver thus being unable to see the signal.

**Traffic when Tramways are under Repair.**—Numerous valuable articles appear in the July issue of "Safety First," the official journal of the Safety First Association and the Road Fellowship League. Sir Charles Rafter, chief constable of Birmingham, gives an account of a successful experiment in the city, whereby traffic keeps to the right on long stretches of repairs on narrow tramway streets, one line following the tramcars under police direction, and with traffic notices placed at each end. The experiment is a reversal of the rule of the road, and should only be adopted in comparatively long stretches of road repairs, and when the tramcars in the portion of the road left for occupation run on the right-hand side of the road.

**Municipal Transport in Glasgow.**—Councillor P. J. Dollan, Convener of the Glasgow Corporation Transport Committee, presiding at a dinner given to the members of the Municipal Tramways and Transport Association in Glasgow on July 11, said that during the last three years they had carried through one of the largest reorganisation programmes ever attempted by any municipal undertaking, and they were hopeful of effecting further improvements in the next few years. Mr. L. Mackinnon, general manager of the Glasgow Transport Department, said he believed every employee of the department was an advertising agent for municipal transport, and he tried to give expression to that belief in his relations with the staff.

**Co-ordination of Brighton Transport Services.**—At Hove Town Council on July 11, Ald. W. Jago stated that the Transport Sub-Committee of the Brighton and the Hove Councils and the representatives of Thomas Tilling, Ltd., had completed their negotiations. Tentative terms have been embodied in a draft agreement, and it is understood that these terms will be submitted to Brighton Corporation on July 24 and to Hove Corporation in September. Under the proposed arrangement the local omnibus services of Thomas Tilling, Ltd., and the tramway services of Brighton would be administered by a body representing the two Corporations and Messrs. Tillings, under the title of the Brighton, Hove and District Traffic Board.

**Barnsley Tramways Abandonment.**—On the receipt of a letter from Barnsley Traction Co., asking if the Council objected to the tramways being abandoned at once, Worsbrough Council decided to express a hope that the company would provide adequate workmen's services and fares on the omnibuses which they are to run. The clerk reminded the Council that they had no bargaining power with the company, who in two months could discontinue the tramways. They were now merely a competitive omnibus company. When the Bill was drafted there was a clause giving a semi-monopoly, but owing to the opposition of Barnsley and the West Riding, this clause was discarded. The company then merely sought powers to abandon.

**Valuation of Railways.**—Under the Railways (Valuation for Rating) Act, 1930, which recently received the Royal Assent, a new body called the Railway Assessment Authority has been set up to deal with the valuation of railways for rating purposes. The chairman of the authority is appointed by the Lord Chancellor, and the nine other members are appointed by the Minister of Health, six of them on the recommendation of bodies representing local authorities. The Authority has been constituted as follows: Mr. Joshua Scholefield, K.C. (chairman); Mr. A. McD. Gordon, London County Council; Sir George Etherton, County Councils' Association; Mr. G. Trevelyan Lee, Association of Municipal Corporations; Mr. H. J. Beavis, Metropolitan Boroughs' Standing Joint Committee; Mr. T. W. Astbury, Urban District Councils' Association; Mr. Edward Knox, Rural District Councils' Association; Sir James Curtis, Sir Edward J. Holland, and Mr. J. E. Tomley.

## FINANCIAL.

**Southport Corporation** tramways and omnibuses made a net profit for the past year of £8,111.

**Derby Transport.**—For the past financial year Derby Corporation Tramways made a gross profit of £23,986. Of this, £22,803 is needed to meet loan charges, the balance going to renewals fund. The omnibuses made a gross profit of £4,985, and after paying loans, etc., there is a net profit of £352.

**Chester Transport.**—During the past financial year Chester tramways had income of £20,000 and expenditure of £13,808, leaving a surplus of £6,226. Income from the omnibuses since they started was £3,748 and expenditure £3,462, a surplus of £286. The expenditure included £201 paid for training the omnibus drivers from October, 1929, to February, 1930.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended July 16 amounted to £81,835, a decrease of £2,273 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to July 16 (15 2-7 weeks), the total receipts were £1,277,037, a decrease of £4,427.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended June 28 give total receipts of £431,978, or £6,729 more than in the corresponding week of last year. The aggregate receipts for thirteen weeks amounted to £5,490,398, an increase of £123,284 over the corresponding period of last year.

**East Ham Corporation Tramways** accounts for the year ended March 31 show a total income of £125,107 and expenditure of £101,830, leaving a gross profit of £23,277, as compared with £22,242 the previous year. After charging £28,278 for interest repayment of loans and a contribution to the sinking fund, £300 for special reserve fund and £6,787 on deficit of last year, there was a deficiency to March 31 last of £8,206.

**Rhondda Tramways Co.**—Presiding at the annual meeting of Rhondda Tramways Co., Ltd., on July 10, Mr. H. T. Barnett, the chairman, said that although there was a profit of £5,323, there was still a loss of £3,787 to be carried forward after the year's profit had been deducted from the loss brought forward from 1928. He pointed out that no improvement could be expected until the condition of the coal industry revived.

**Edinburgh Corporation Transport** had combined revenue from tramcars and omnibuses last year of £927,114, an increase of £50,159 on the previous year. Passengers numbered 164,401,891, an increase of 8,171,101. The net surplus on the tramways was £2,097, and on the omnibuses £1,056. Capital expenditure on tramways to date is £3,092,970, of which £1,909,041 has been paid off. Capital expenditure on omnibuses and garages is £351,685, of which £250,693 has been paid off.

**Cardiff Tramways and Motors.**—For the past financial year Cardiff tramway receipts totalled £246,647, a decrease of £5,864 on the previous year, the working expenses, however, also showing a decrease of £13,438. Omnibus receipts were £156,639 and working expenses £143,255, leaving a revenue balance of £13,384. Tramcar passengers decreased by 1,409,366, and omnibus passengers increased by 1,524,888. The Tramways Committee have congratulated the general manager, Mr. W. Forbes, on the improved position and on the businesslike conduct of the undertaking under unfavourable circumstances.

**London Electric Railway Issue.**—Within an hour of the opening of the lists of the London Electric Railway Company's redeemable debenture stock, offered for subscription on Friday last, the issue was heavily over-subscribed. The issue amounted to £5,000,000 of 5 per cent. stock at £97 10s. per cent. This is part of the sum authorised by the London Electric Railway Company's 1930 Act, the total of which is £11,850,000. The Government is making grants in respect of the work involved at the rate of 3 per cent. aggregate maximum of £9,917,000. Applicants for £100 stock received allotment in full, those for £1,000 received £100, and the basis of allotment on the larger amounts was 10 per cent.

**Portsmouth Corporation Tramways.**—Alderman Sir John Timpson, K.B.E., chairman of Portsmouth Tramways Committee, in submitting the accounts of the Tramways Committee for 1929-30, said that the undertaking had had a very satisfactory year. The number of passengers carried had been increased by three millions, the total revenue was £317,989 on the cars and £65,270 on the omnibuses. The net surplus on the cars amounted to £32,219, out of which they had to meet an increased demand of £4,910 for income tax. The net deficit on the omnibuses was £2,031. Both omnibuses and tramcars lost money during the winter months. The department paid £8,800 a year in local rates and had spent £81,087 on the permanent way, to the advantage of users of roads generally.

**An Unfavourable Year at Bradford.**—Bradford Tramways Department shows a loss of £29,962 on the past year's working. In the previous year there was a loss of £23,940. The receipts for 1929-30 exceeded those of the previous year by over £40,000. The loss of £29,962 was made up as follows: Tramways, £9,126; trolleybuses, £7,298; petrol omnibuses, £13,942; parcels department, £404. Mr. Walter Hodgson, deputy chairman of the Tramways Department, considers that the only way to prevent a further loss is that the Corporation should have reasonable protection so that it can compete more equitably with private enterprise. He pointed out that in Leeds private omnibus fares were 2d. above the municipal tramways fares, while in Bradford the increase was only 1d.

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## CONTRACTS.

**A Dennis Contract.**—The Aldershot & District Traction Co., Ltd., are constantly adding to their fleet. Some 280 Dennis omnibuses have already been put into service, and this successful company have just placed their latest order for a large number of H.V. type from the Dennis factory. This is a low-load omnibus chassis, with vacuum-servo 4-wheel brakes, designed for a covered-top, double-deck body accommodating 50-52 passengers.

**A Bell Punch Contract.**—When the renewal of a contract for punches with the Bell Punch & Printing Co., Ltd., came up for consideration by the Dover Tramways Committee, Councillor Morecroft suggested that they might buy punches outright. The contract was for the hire of 55 punches for five years. Mr. E. H. Bond, the manager, explained that they had had several other punches on trial, but they were not satisfactory, there was no undertaking as to repairs, and they cost £6 each. It was decided to renew the contract with the Bell Punch Company.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | July 15 | 565 | 555 | — 10 | 15 | 8,629 | — 188 |
| „ Motor Buses ... | „ 15 | 219 | 286 | + 67 | 15 | 4,349 | + 610 |
| „ Total ... ... | „ 15 | 784 | 841 | + 57 | 15 | 12,978 | + 422 |
| Aberdeen Corp. ... | „ 9 | 5,061 | 5,683 | + 622 | 5½ | 30,258 | + 1,661 |
| Ashton-u-Lyne Corp. | „ 5 | 918 | 851 | — 67 | 14 | 11,984 | — 834 |
| „ Motor Buses ... | „ 5 | 499 | 507 | + 8 | 14 | 7,027 | + 45 |
| „ Trolley Buses ... | „ 5 | 279 | 244 | — 35 | 14 | 3,714 | — 251 |
| „ Total ... ... | „ 5 | 1,696 | 1,602 | — 94 | 14 | 22,725 | — 1,040 |
| Ayr Corporation ... | „ 12 | 764 | 665 | — 99 | 8 | 4,736 | — 358 |
| Barrow Corporation... | „ 5 | 649 | 657 | + 8 | 14 | 8,130 | — 471 |
| „ Motor Buses ... | „ 5 | 435 | 472 | + 37 | 14 | 5,527 | + 1,049 |
| „ Total ... ... | „ 5 | 1,084 | 1,129 | + 45 | 14 | 13,657 | + 578 |
| Belfast City ... ... | „ 11 | 11,855 | 11,976 | + 121 | 14½ | 170,893 | + 7,207 |
| „ Motor Buses ... | „ 11 | 1,047 | 1,301 | + 254 | 14½ | 19,894 | + 4,208 |
| „ Total ... ... | „ 11 | 12,902 | 13,277 | + 375 | 14½ | 190,787 | + 11,415 |
| Birkenhead Corp. ... | „ 13 | 1,780 | 1,587 | — 193 | 15 | 23,756 | — 1,636 |
| „ Motor Buses ... | „ 13 | 3,763 | 3,810 | + 47 | 15 | 53,569 | + 3,992 |
| „ Total ... ... | „ 13 | 5,543 | 5,397 | — 146 | 15 | 77,325 | + 2,356 |
| Birmingham Corp. ... | „ 8 | 27,583 | 26,968 | — 615 | 14 | 379,193 | — 4,208 |
| „ Motor Buses ... | „ 8 | 13,324 | 15,791 | + 2,467 | 14 | 218,326 | + 39,927 |
| „ Trolley Buses ... | „ 8 | 574 | 554 | — 20 | 14 | 7,877 | + 139 |
| „ Total ... ... | „ 8 | 41,481 | 43,313 | + 1,832 | 14 | 605,396 | + 35,858 |
| Blackburn Corp. ... | „ 9 | 1,970 | 1,874 | — 96 | 14½ | 26,788 | — 1,548 |
| „ Motor Buses ... | „ 9 | Nil | 303 | + 303 | 14½ | 4,608 | + 4,608 |
| „ Total ... ... | „ 9 | 1,970 | 2,177 | + 207 | 14½ | 31,396 | + 3,060 |
| Bradford Corporation | „ 12 | 14,896 | 14,501 | + 395 | 15 | 213,127 | — 9,949 |
| Brighton Corporation | „ 13 | 2,961 | 3,014 | + 53 | 14½ | 39,674 | + 2,258 |
| Burnley Corporation... | „ 12 | 2,490 | 2,409 | — 81 | — | ... | — |
| „ Motor Buses ... | „ 12 | 521 | 605 | + 84 | — | — | — |
| „ Total ... ... | „ 12 | 3,011 | 3,014 | + 3 | ... | ... | — |
| Burton-on-Trent Corp. | „ 13 | 813 | 799 | — 14 | 15 | 12,637 | + 809 |
| Bury Corporation ... | „ 13 | 1,999 | 1,816 | — 183 | 14½ | 27,517 | — 3,830 |
| „ Motor Buses ... | „ 13 | 422 | 1,112 | + 690 | 14½ | 16,300 | + 10,389 |
| „ Total ... ... | „ 13 | 2,421 | 2,928 | + 507 | 14½ | 43,817 | + 6,559 |
| Cardiff Corporation ... | „ 12 | 7,922 | 7,859 | — 63 | 14½ | 115,671 | + 2,863 |
| Chatham and District | „ 10 | 1,311 | 1,353 | + 42 | 27 | 30,467 | + 1,415 |
| Chester Corporation ... | „ 13 | 453 | Nil | — 453 | 15 | Nil | — 6,727 |
| „ Motor Buses ... | „ 13 | Nil | 680 | + 680 | 15 | 9,772 | + 9,772 |
| „ Total ... ... | „ 13 | 453 | 680 | + 227 | 15 | 9,772 | + 3,045 |
| Chesterfield Corp. ... | „ 14 | 1,839 | 1,858 | + 19 | 15 | 27,930 | + 1,076 |
| Colchester Corp. ... | „ 16 | 630 | 680 | + 50 | 16 | 9,433 | + 1,066 |
| Colne Corporation ... | „ 16 | 808 | 692 | — 116 | 15 | 10,930 | + 55 |
| Coventry Corporation | „ 13 | 2,124 | 1,923 | — 201 | 15 | 30,615 | — 1,831 |
| „ Motor Buses ... | „ 13 | 1,546 | 1,781 | + 235 | 15 | 27,431 | + 3,812 |
| „ Total ... ... | „ 13 | 3,670 | 3,704 | + 34 | 15 | 58,046 | + 1,981 |
| Darlington Corp. ... | „ 12 | 969 | 1,073 | + 104 | 14½ | 15,789 | + 1,497 |
| Derby Corporation ... | „ 12 | 2,503 | 2,449 | — 54 | 15 | 36,602 | — 465 |
| „ Motor Buses ... | „ 12 | 762 | 912 | + 150 | 15 | 13,603 | + 3,505 |
| „ Total ... ... | „ 12 | 3,265 | 3,361 | + 96 | 15 | 50,205 | + 3,040 |
| Dover Corporation ... | „ 12 | 443 | 474 | + 31 | 15 | 5,970 | + 272 |
| Dundee Corporation... | „ 1 | 2,600 | 2,529 | — 71 | 6½ | 17,686 | — 582 |
| „ Motor Buses ... | „ 1 | 805 | 1,156 | + 351 | 6½ | 6,797 | + 1,096 |
| „ Total ... ... | „ 1 | 3,405 | 3,685 | + 280 | 6½ | 24,483 | + 514 |
| East Ham Corp. ... | „ 12 | 2,234 | 2,317 | + 83 | 14½ | 34,319 | + 882 |
| Edinburgh Corp. ... | „ 5 | 17,982 | 18,922 | + 940 | 7½ | 116,906 | + 2,392 |
| „ Motor Buses ... | „ 5 | 4,157 | 4,620 | + 463 | 7½ | 30,042 | + 2,813 |
| „ Total ... ... | „ 5 | 22,139 | 23,542 | + 1,403 | 7½ | 146,948 | + 5,205 |
| Exeter Corporation ... | „ 16 | 909 | 855 | — 54 | 16 | 12,895 | — 570 |
| „ Motor Buses ... | „ 16 | 163 | 300 | + 137 | 16 | 4,422 | + 2,505 |
| „ Total .. ... | „ 16 | 1,072 | 1,155 | + 83 | 16 | 17,317 | + 1,935 |
| Glasgow Corporation... | June 28 | 46,055 | 45,219 | — 836 | 4 | 183,870 | + 3,175 |
| „ Motor Buses ... | „ 28 | 5,355 | 8,696 | + 3,341 | 4 | 34,758 | + 13,500 |
| „ Total ... ... | „ 28 | 51,410 | 53,915 | + 2,505 | 4 | 218,628 | + 16,675 |
| Gloucester Corp. ... | July 9 | 578 | 814 | + 236 | 14½ | 10,155 | + 2,342 |
| Grimsby Corporation | „ 12 | 1,436 | 1,637 | + 201 | 15 | 22,798 | + 2,935 |
| Halifax Corporation | „ 8 | 4,396 | 5,277 | + 881 | 14½ | 73,958 | + 9,003 |
| Huddersfield Corp. ... | „ 12 | 6,429 | 6,524 | + 95 | 15 | 95,819 | — 1,175 |
| Hull Corporation ... | „ 12 | 5,724 | 5,488 | — 236 | 15 | 85,736 | — 871 |
| „ Motor Buses ... | „ 12 | 1,324 | 1,622 | + 298 | 15 | 21,711 | + 2,238 |
| „ Total ... ... | „ 12 | 7,048 | 7,110 | + 62 | 15 | 107,447 | + 1,367 |
| Ilford Corporation ... | „ 12 | 1,462 | 1,550 | + 88 | 14½ | 22,718 | + 517 |
| Ipswich Corp. Trol.Bus | „ 12 | 1,294 | 1,326 | + 32 | 14½ | 19,653 | + 1,190 |
| Isle of Thanet ... | „ 9 | 1,488 | 1,449 | — 39 | 27½ | 15,729 | — 530 |
| Kilmarnock Corp. ... | „ 12 | 475 | 486 | + 11 | 8½ | 4,122 | + 166 |
| Lancashire Un. ... | June 29 | 2,271 | 2,140 | — 131 | 25½ | 55,783 | — 2,572 |
| „ Motor Buses ... | „ 29 | 4,574 | 4,859 | + 285 | 25½ | 122,870 | + 18,201 |
| Leeds Corporation ... | July 12 | 20,093 | 20,818 | + 725 | 14½ | 299,736 | + 10,179 |
| Leicester Corp. ... | „ 12 | 8,572 | 8,397 | — 175 | 15 | 125,118 | + 1,688 |
| Lincoln Corp. ... | June 29 | 909 | 895 | — 14 | 13 | 11,958 | + 52 |
| Liverpool Corp. ... | July 12 | 30,680 | 30,627 | — 53 | 14½ | 448,222 | + 5,911 |
| London County Coun. | „ 16 | 84,108 | 81,835 | — 2,273 | 15½ | 1,277,037 | — 4,427 |
| Luton Corporation ... | „ 9 | 402 | 483 | + 81 | 14½ | 6,300 | + 397 |
| Maidstone Corp. ... | „ 10 | 232 | Nil | — 232 | 14½ | Nil | — 3,615 |
| „ Motor Buses ... | „ 10 | 270 | 285 | + 15 | 14½ | 4,056 | + 40 |
| „ Trolley Buses ... | „ 10 | 299 | 588 | + 289 | 14½ | 9,112 | + 4,621 |
| „ Total ... ... | „ 10 | 801 | 873 | + 72 | 14½ | 13,168 | + 1,046 |
| Manchester Corp. ... | „ 5 | 36,166 | 33,819 | — 2,347 | 14 | 447,353 | — 39,371 |
| „ Motor Buses ... | „ 5 | 5,314 | 9,257 | + 3,943 | 14 | 119,030 | + 50,020 |
| „ Total ... ... | „ 5 | 41,480 | 43,076 | + 1,596 | 14 | 566,383 | + 10,649 |
| Middlesbrough Corp. | „ 8 | 1,106 | 1,123 | + 17 | 14½ | 15,110 | — 833 |
| „ Motor Buses ... | „ 8 | 510 | 611 | + 101 | 14½ | 8,110 | + 945 |
| „ Total ... ... | „ 8 | 1,616 | 1,734 | + 118 | 14½ | 23,220 | + 112 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | | £ | | | £ | £ |
| Newcastle-on-Ty.Corp. | July 12 | 10,004 | 8,455 | — 1,549 | 14½ | 131,033 | — 16,977 |
| „ Motor Buses ... | „ 12 | 1,963 | 3,166 | + 1,203 | 14½ | 44,294 | + 14,144 |
| „ Total ... ... | „ 12 | 11,967 | 11,621 | — 346 | 14½ | 175,327 | — 2,833 |
| Newport Corporation | „ 5 | 748 | 802 | + 54 | 14 | 11,327 | + 995 |
| „ Motor Buses ... | „ 5 | 1,726 | 1,621 | — 105 | 14 | 22,318 | — 678 |
| „ Total ... ... | „ 5 | 2,474 | 2,423 | — 51 | 14 | 33,645 | + 317 |
| Northampton Corp. ... | „ 11 | 1,082 | 1,052 | — 30 | 14½ | 16,112 | — 357 |
| „ Motor Buses ... | „ 11 | 708 | 702 | — 6 | 14½ | 10,654 | + 1,301 |
| „ Total ... ... | „ 11 | 1,790 | 1,754 | — 36 | 14½ | 26,766 | + 944 |
| Nottingham Corp. ... | „ 10 | 6,787 | 6,064 | — 723 | 14½ | 84,499 | — 11,298 |
| „ Motor Buses ... | „ 10 | 2,276 | 3,533 | + 1,257 | 14½ | 48,014 | + 15,357 |
| „ Trolley Buses ... | „ 10 | 593 | 1,226 | + 633 | 14½ | 17,488 | + 8,860 |
| „ Total ... ... | „ 10 | 9,656 | 10,823 | + 1,167 | 14½ | 150,001 | + 12,919 |
| Oldham Corporation | „ 12 | 3,702 | 3,281 | — 421 | 16 | 53,513 | — 3,952 |
| „ Motor Buses ... | „ 12 | 2,104 | 2,007 | — 97 | 16 | 32,153 | — 327 |
| „ Total ... ... | „ 12 | 5,806 | 5,288 | — 518 | 16 | 85,666 | — 4,279 |
| Plymouth Corp. ... | „ 12 | 4,028 | 3,776 | — 252 | 14½ | 53,732 | — 956 |
| „ Motor Buses ... | „ 12 | 1,966 | 2,479 | + 513 | 14½ | 35,313 | + 7 561 |
| „ Total ... ... | „ 12 | 5,994 | 6,255 | + 261 | 14½ | 89,045 | + 6,605 |
| Portsmouth Corp. ... | „ 12 | 5,149 | 4,761 | — 388 | 15 | 58,866 | — 4,347 |
| „ Motor Buses ... | „ 12 | 2,190 | 3,692 | + 1,502 | 15 | 48,114 | + 18,733 |
| „ Total ... ... | „ 12 | 7,339 | 8,453 | + 1,114 | 15 | 106,980 | + 14,386 |
| Preston Corporation... | „ 9 | 1,771 | 1,694 | — 77 | 14½ | 23,884 | — 1,095 |
| „ Motor Buses ... | „ 9 | 495 | 527 | + 32 | 14½ | 7,376 | + 483 |
| „ Total ... ... | „ 9 | 2,266 | 2,221 | — 45 | 14½ | 31,260 | — 612 |
| Rawtenstall Corp. ... | „ 13 | 873 | 671 | — 202 | 14½ | 10,044 | — 2,894 |
| „ Motor Buses ... | „ 13 | 576 | 713 | + 137 | 14½ | 10,472 | + 2,459 |
| „ Total ... ... | „ 13 | 1,449 | 1,384 | — 65 | 14½ | 20,516 | — 435 |
| Reading Corporation | „ 10 | 1,529 | 1,462 | — 67 | 15 | 20,986 | — 697 |
| „ Motor Buses ... | „ 10 | 944 | 1,012 | + 68 | 15 | 14,890 | + 1,798 |
| „ Total ... ... | „ 10 | 2,473 | 2,474 | + 1 | 15 | 35,876 | + 1,101 |
| Rochdale Corp. ... | „ 12 | 3,158 | 2,906 | — 252 | ... | 41,412 | — 3,597 |
| „ Motor Buses ... | „ 12 | 1,635 | 1,596 | — 39 | — | 23,539 | + 725 |
| „ Total ... ... | „ 12 | 4,793 | 4,502 | — 291 | ... | 64,951 | — 2,872 |
| Rotherham Corp. ... | „ 7 | 2,660 | 2,673 | + 73 | 14 | 38,954 | + 2,010 |
| Salford Corporation ... | „ 13 | 11,509 | 11,304 | — 205 | 14½ | 169,864 | + 3,377 |
| Sheffield Corp. ... | „ 12 | 20,970 | 20,241 | — 729 | 14½ | 310,628 | — 1,902 |
| Southampton Corp. ... | „ 9 | 3,483 | 3,571 | + 88 | 15 | 49,489 | + 1,161 |
| „ Motor Buses ... | „ 9 | 832 | 908 | + 76 | 15 | 12,700 | + 2,168 |
| „ Total ... ... | „ 9 | 4,315 | 4,479 | + 164 | 15 | 62,189 | + 3,329 |
| Southend-on-Sea Corp. | „ 9 | 2,496 | 2,559 | + 63 | 14½ | 30,015 | — 760 |
| „ Motor Buses ... | „ 9 | 180 | 397 | + 217 | 14½ | 4,125 | + 1,962 |
| „ Total ... ... | „ 9 | 2,676 | 2,956 | + 280 | 14½ | 34,140 | + 1,202 |
| Southport Corp. ... | „ 12 | 1,448 | 1,505 | + 57 | 14½ | 19,646 | — 9 |
| „ Motor Buses ... | „ 12 | 422 | 484 | + 62 | 14½ | 6,251 | + 739 |
| „ Total ... ... | „ 12 | 1,870 | 1,989 | + 119 | 14½ | 25,897 | + 730 |
| St. Helens Corp. ... | „ 8 | 1,941 | 2,067 | + 126 | 14½ | 28,870 | + 2,084 |
| Sunderland Corp. ... | „ 15 | 2,695 | 2,519 | — 176 | 15 | 37,961 | + 1,733 |
| „ Motor Buses ... | „ 15 | 383 | 561 | + 178 | 15 | 7,759 | + 5,476 |
| „ Total ... ... | „ 15 | 3,078 | 3,080 | + 2 | 15 | 45,720 | + 7,209 |
| Swindon Corp. ... | „ 9 | 679 | 1,059 | + 380 | 14½ | 13,191 | + 2,908 |
| Wallasey Corp. ... | „ 12 | 1,414 | 1,303 | — 111 | 14½ | 18,675 | — 1,176 |
| „ Motor Buses ... | „ 12 | 2,376 | 2,717 | + 341 | 14½ | 34,719 | + 4,365 |
| „ Total ... ... | „ 12 | 3,790 | 4,020 | + 230 | 14½ | 53,394 | + 3,189 |
| Walsall Corporation... | „ 6 | 3,265 | 3,263 | — 2 | 14 | 49,029 | + 1,754 |
| Walthamstow Corp. ... | „ 12 | 2,549 | 2,571 | + 21 | 14½ | 37,092 | + 302 |
| Warrington Corp. ... | „ 10 | 851 | 837 | — 14 | 15 | 13,301 | + 29 |
| „ Motor Buses ... | „ 10 | 427 | 484 | + 57 | 15 | 7,543 | + 908 |
| „ Total ... ... | „ 10 | 1,278 | 1,321 | + 43 | 15 | 20,844 | + 937 |
| West Ham Corp. ... | „ 10 | 5,909 | 6,047 | + 138 | 14½ | 89,320 | + 2,575 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | „ 6 | 2,720 | 2,344 | — 376 | 14 | 31,850 | — 4,874 |
| „ Trolley Buses ... | „ 6 | 3,342 | 3,426 | + 84 | 14 | 46,246 | + 3,329 |
| „ Total ... ... | „ 6 | 6,062 | 5,770 | — 292 | 14 | 78,096 | — 1,545 |
| York Corporation ... | „ 9 | 1,037 | 1,061 | + 24 | 15 | 15,151 | + 609 |
| „ Motor Buses ... | „ 9 | 387 | 497 | + 110 | 15 | 7,289 | + 2,029 |
| „ Trolley Buses ... | „ 9 | 65 | Nil | — 65 | 15 | Nil | — 726 |
| „ Total ... ... | „ 9 | 1,489 | 1,558 | + 69 | 15 | 22,440 | + 1,912 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or *M* | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | July 15 | £77,165 | £74,699 | 28 w | £2,347,157 | — £89,548 |
| Brazilian Traction $ | May | 4,206,805 | 4,304,160 | 5 m | 20,139,475 | + 313,343 |
| British Columbia $ | May | 1,165,279 | 1,203,292 | 11 m | 13,514,147 | + 599,302 |
| Buenos Aires Lacroze | July 13 | 11,027 | 10,011 | 2 w | 20,022 | — 2,830 |
| Burma E. Sup. Co. Rs. | May | 66,077 | 66,320 | 10 m | 643,528 | — 22,026 |
| Calcutta ... Rs. | July 12 | 126,332 | 98,491 | 27½ w | 3,126,669 | — 402,505 |
| Cape Town ... ... | May | 29,366 | 27,286 | ... | ... | — |
| Carthagena & Herrerias | June | 1,476 | 515 | 6 m | 5,612 | — 209 |
| Durban ... ... | May | 24,518 | 23,945 | 10 m | 238,483 | — 714 |
| East India ... ... | June | 3,772 | 3,803 | 11 m | 41,627 | + 438 |
| Kalgoorlie ... ... | Apr. | 1,673 | 1,718 | 4 m | 6,319 | Nil |
| Madras (2 weeks) Rs. | July 15 | 50,308 | 52,435 | 26 w | 600,966 | + 30,600 |
| Para ... ... | June | 15,450 | 15,028 | 7 m | 103,807 | + 749 |
| Port Elizabeth ... | May | 7,601 | 7,552 | ... | ... | ... |
| Rangoon ... Rs. | June | 114,535 | 142,170 | 6 m | 809,635 | + 190,824 |
| Shanghai ... $ | June | 335,740 | 367,231 | 6 m | 1,923,202 | — 42,708 |
| Singapore ... ...$ | June | 123,000 | 140,000 | 9 m | 1,223,000 | + 140,000 |
| Winnipeg ..$ | May | 534,954 | 509,709 | 5 m | 2,793,546 | — 28,794 |

## RAILWAY RECEIPTS.

| 28th Week ended July 13th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 294,000 | — 16,000 | 307,000 | — 34,000 | 601,000 | — 50,000 | — 620,000 |
| L.M.S.R. | 623,000 | — 97,000 | 727,000 | — 100,000 | 1,350,000 | — 197,000 | —1,944,000 |
| L.N.E.R. | 431,000 | — 43,000 | 596,000 | — 82,000 | 1,027,000 | — 125,000 | —1,028,000 |
| S.R. | 384,000 | — 17,000 | 105,000 | — 1,000 | 489,000 | — 18,000 | —141,000 |
| Totals | 1,732,000 | — 173,000 | 1,735,000 | — 217,000 | 3,467,000 | — 390 000 | —3,733,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| LONDON UNDERGROUND | | | | | | |
| Common Fund Cos. | July 12 | 308,600 | 317,700 | + 9,100 | 8,457,100 | + 569,900 |
| Lond. & Sub. Group | „ 12 | 45,800 | 47,300 | + 1,500 | 1,233,200 | + 97,900 |
| METROPOLITAN RAILWAY | „ 12 | 37,100 | 37,000 | — 100 | 1,030,500 | + 24,700 |
| LIVERPOOL OVERHEAD | „ 13 | 1,752 | 1,719 | — 33 | 42,957 | — 2,395 |
| MERSEY RAILWAY ... | „ 12 | 4,342 | 4,392 | + 50 | 128,853 | + 4,120 |

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LONDON, JULY 26, 1930.

## THE REVIVING TRAMCAR.

The notable increase in the number of passengers carried by the London County Council tramways during the last financial year suggests that the popularity of the tramcar amongst the travelling public is reviving. For the year there was a total of 726,414,871 passengers, or an increase of 13,719,875. These figures are made still more significant when examined in conjunction with those given by the Special Committee on Traffic for Greater London. They show that in 1929, while both tramways and railways increased their total—the former by 18,877,252—omnibuses suffered a decrease of 137,956, although they carried 48.4 per cent. of Greater London's passengers, the tramways carrying 27.2 per cent. At the meeting of the London County Council on Tuesday, Mr. F. B. Galer, chairman of the Highways Committee, declared that the more comfortable vehicles provided are being appreciated by the public. In other places where the tramways are maintaining or increasing their position in the public favour, the same reason is forthcoming. At Leeds, where the tramway receipts have increased by 2.03 per cent. during the past year, Mr. R. L. Horsfield, the general manager, refers to the purchase of 100 new cars as "providing passengers with more up-to-date, speedier, and more comfortable transport facilities, and ensuring a continuance of the popularity of the tramcar as the cheapest and safest means of local transit." Further testimony is contained in the statement of Alderman Banton, chairman of the Leicester Tramways Committee, who says that there have been so many improvements in tramcars in recent years that they are regaining favour in many quarters, although at one time opinion in the tramway field seemed to suggest that there were fears that ultimately cars would have to go. There seems no doubt, therefore, that in the provision of comfortable cars lies the main hope of future success of tramway undertakings in maintaining and regaining the favour of the public, which is quick to appreciate both the comfort of the vehicle and the enterprise that provides it. For some time tramcar design in general was practically stereotyped, while improvements in motor omnibuses have been continuous, and tramways suffered accordingly. Now that so much effort is being concentrated on the production of cars that will meet the modern demand for comfortable and easy travel, tramway operators should have no difficulty in obtaining such vehicles as will give them every prospect of regaining popularity with the public.

## GLASGOW BILL BEFORE LORDS COMMITTEE.

PROTECTION LIMITED—NO OMNIBUS BUILDING.

The Select Committee of the House of Lords, presided over by Lord Meston, which has been considering the Glasgow Corporation Bill, decided last week to confine protection against private omnibus competition to the city of Glasgow only, and rejected the clause which sought power to build omnibus bodies.

Following the evidence of Mr. L. Mackinnon, general manager of the Corporation transport, reported in our last issue, Mr. Graham Robertson, K.C., on July 17 addressed the Committee on behalf of the omnibus owners affected. He said that the Corporation had put forward proposals for "a stark staring monopoly" of tramway and omnibus services in their area and that no such monopoly should be given unless there was some compelling reason in the public interest. There was no such reason here, either financial or otherwise. As regarded the burghs of Renfrew and Rutherglen, not only would the consent of the local authority be no longer required but the licensing jurisdiction of these burghs would be taken from them. The Glasgow undertaking was a flourishing and successful concern and was the last of such undertakings that should ask for protection. It was estimated that about a quarter of a million per annum was taken by the privately owned omnibuses. Was that to be taken from them without any compensation after they had created this traffic?

After Mr. A. P. Duffes, K.C., for the burgh of Rutherglen, and Mr. E. D. Anderson, Town Clerk of Renfrew, had given evidence, the Committee decided to allow Part II of the Bill to go forward if Clause 16 was altered so as to confine the protection area to the city of Glasgow only, thus excluding Renfrew and Rutherglen, and to the tramway routes within the city.

OMNIBUS BUILDING POWERS REFUSED.

On July 18, Clause 18, which sought power to manufacture omnibus bodies, was considered.

Mr. W. G Normand, K.C., for the promoters, said the Corporation had power to manufacture tramcar bodies and that they could produce these 20 per cent. cheaper than they could buy from outside manufacturers. In the future they would be manufacturing substantially fewer tramcars, and in the immediate future probably none at all, because they would be substituting omnibuses for tramcars.

Mr. Mackinnon, in giving evidence, said that the proposal would not involve any addition to the works at Coplawhill, which were as well equipped as any in the country and better than most. In cross-examination he said the Corporation had 216 licensed omnibuses, all of which had been bought from outside traders.

Mr. Rowland Harker, K.C., for the Society of Motor Manufacturers and Traders and the Scottish Motor Trade Association, said this was a trade that necessitated much experimental work, and it was not in the public interest that such a strong combination as it represented should meet with interference in giving the public the best type of omnibus possible. If such important customers as the municipalities were lost to the trade, it would affect them seriously and also their employees.

Mr. G. W. Watson, a consulting engineer and a past-president of the Institute of Automobile Engineers, said the manufacture of tramcars was different from that of omnibuses. A tramcar body was built on a very solid rolled-steel frame constructed for running on a track, whereas omnibuses were built on comparatively flexible frames to suit the undulations of the roads. To build bodies comparable with modern omnibus bodies the Corporation would have to lay down special plant. He was confident that the Corporation could not manufacture omnibus bodies economically in competition with private manufacturers.

The Chairman of the Committee intimated that they had agreed that Clause 18 could not stand part of the Bill.

The Bill was then passed for its third reading.

**London Station Gardens.**—The annual competition for the best station gardens on the London District Railway took place on Tuesday, when directors and officials visited the competing stations as a committee of judges. There were thirty-two competitors, and the following awards were made:—First prizes: Ealing Common and Ealing Broadway. Second: Walham Green (east platform), Acton Town (signal depot), and Acton Town (east platform). Third: Walham Green (west platform), Acton Town (east platform), and Northfields. Fourth: Minories Junction, Sudbury Town, and Boston Manor. Twelve fifth prizes were also awarded. The judges were: Col. Sir Herbert Jekyll, Mr. Murray Griffith, Sir Ernest Clark (Directors of the Railway), Mr. J. C. Mitchell (Secretary and Treasurer), Mr. J. Thornton (Superintendent of the Line), and Mr. T. Hay (Superintendent of the Royal Parks).

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## LONDON COUNTY COUNCIL TRAMWAYS.

### SURPLUS FOR THE YEAR 1929-30.

At the meeting of the London County Council on Tuesday the annual accounts of the tramways for the year ended March 31, 1930, were submitted by the Highways Committee. The report stated that there was a surplus for the year of £128,803. In 1927-28 there was a deficiency of £226,211, which was reduced to £6,789 in 1928-29. The chief factors in the improvement are an increase of £86,391 in traffic receipts and a reduction of £72,564 in working expenses. The results of the working of the undertaking during the year 1929-30 compared with the two preceding years are as follow :—

| | 1929-30. | 1928-29. | 1927-28. |
|---|---|---|---|
| | £ | £ | £ |
| Income ... ... ... ... ... | 4,460,536 | 4,373,944 | 4,333,783 |
| Working expenses (including special charges, £531 12s. 2d.) ... ... ... ... | 3,613,330 | 3,684,987 | 3,810,825 |
| Surplus on working ... ... ... ... | 847,206 | 688,957 | 522,958 |
| Debt charges ... ... ... ... ... | 758,625 | 740,370 | 785,090 |
| Income Tax—Schedule D (in addition to property tax) ... ... ... ... | 20,436 | 15,923 | 37,283 |
| Parliamentary expenses ... ... ... | 312 | 2,552 | 1,151 |
| Amount due to Leyton Corporation ... | 14,383 | 9,425 | 7,210 |
| | 793,756 | 768,270 | 830,734 |
| Less deductions : on account of Income Tax (£48,783), Rents (£8,521), Government Grant towards unemployment schemes (£4,753), interest on cash balances (£13,103), etc. ... ... ... ... | 75,353 | 72,523 | 81,567 |
| | 718,403 | 695,746 | 749,168 |
| Surplus for the year ... ... ... | 128,803 | 6,789 (Deficiency) | 226,211 (Deficiency) |

The total number of passengers carried during the year was 726,414,871, and the number of car miles run was 70,756,225 (net figures after adjustments in respect of inter-running). The corresponding figures for some previous years are set out in the table appended :—

| Year ended. | Route Length miles. | Expenses per car mile. | Receipts per car mile. | Car miles run. | Passengers carried. | Gross Traffic receipts. |
|---|---|---|---|---|---|---|
| | | d. | d. | | | £ |
| 1925 | 164.14 | 14.08 | 14.63 | 68,068,216 | 682,595,733 | 4,148,923 |
| 1926 | 164.44 | 13.56 | 14.53 | 68,530,795 | 690,222,969 | 4,148,998 |
| 1927 | 165.35 | 13.69 | 14.28 | 67,113,143 | 667,103,489 | 3,993,601 |
| 1928 | 165.72 | 12.70 | 14.37 | 69,890,518 | 705,762,261 | 4,185,550 |
| 1929 | 166.28 | 12.38 | 14.62 | 70,170,486 | 712,694,996 | 4,274,010 |
| 1930 | 166.28 | 12.03 | 14.79 | 70,756,225 | 726,414,871 | 4,360,401 |

The net operating expenses were £3,546,244, including special charges of £532, and the costs of renewals amounted to £198,899.

### CAPITAL EXPENDITURE AND REDEMPTION OF DEBT.

The total net expenditure on the undertaking to March 31, 1930, amounted to £17,719,198, including £294,907 expended during the current year. The total amount of debt to March 31, 1930, was £18,126,719, and the net debt on March 31, was £8,300,593. The total provision for redemption of debt amounts to £9,826,125. During the year sums paid for rates on the permanent way amounted to £27,075. This was in addition to £71,693 paid as rates in respect of tramway offices, power station, car sheds, etc. The saving to the road authorities owing to the maintenance of the paving along the tramway routes by the Council was estimated at about £233,500. The amount charged to March 31, 1930, to the tramways capital account in respect of cost of street improvements along tramway routes is £752,280.

### 2D. ALL-THE-WAY FARES ON SUNDAY.

The Committee recommended that 2d. all-the-way fares on Sunday should be instituted as an experiment during the months of August, September and October, 1930, with the object of recovering part, at least, of the revenue lost owing to increased omnibus competition. The Committee pointed out that no action has yet been taken towards the restriction of omnibus services on Sunday, and they give the following figures of receipts per car mile for weekdays and Sundays as indicating the adverse effect of the unrestricted competition :—

| | 1922. | 1923. | 1926. | 1929-30. |
|---|---|---|---|---|
| | d. | d. | d. | d. |
| Sundays ... ... ... | 19.5 | 17.5 | 14.6 | 14.3 |
| Weekdays ... ... ... | 18.5 | 16.5 | 14.3 | 14.7 |
| Excess (+) or deficiency (—) Sundays compared with weekdays ... ... | +1.0 | +1.0 | +0.3 | —0.4 |

The Committee recommended also that 4d. tickets available for unlimited travel between the hours of 8 a.m. and 5 p.m. when schools are in session should be issued as an experiment to school children during the autumn session of 1930, subject in the case of children between the age of 14 and 16 to proof of school attendance.

The Highways Committee reported with regret that Sir George Hume has retired from the Committee and recorded their high appreciation of the service rendered by him during a membership extending over 20 years, for five of which, 1914-19, he was chairman of the Committee.

## THE ROAD TRAFFIC BILL.

### THIRD READING PASSED.

Consideration of the Road Traffic Bill, as amended, was resumed by the House of Commons on July 22. Mr. Morrison (Minister of Transport) moved an amendment to clause 114 to enable payment to be made out of the Road Fund of "expenses incurred in disseminating knowledge or otherwise informing the minds of the people with a view to promoting safety on the roads." He said it would be necessary to disseminate knowledge about the highway code, and the amendment gave the necessary financial power.

The amendment was agreed to and the report stage was concluded.

On the motion for the third reading, Mr. Morrison said the abolition of the speed limit in itself would not make any difference in the existing practice on the roads. He appealed to the police authorities and the magistrates to co-operate in securing a firm administration of the law, and the infliction of penalties imposed by the Act. He appealed to the motoring public also to take all possible care to reduce accidents on the highway.

### APPEAL TO LICENSING AUTHORITIES.

Some local authorities were granting licences on a rather wholesale basis at present on the assumption that their functions were coming to an end. He appealed to the licensing authorities to exercise their powers with care and responsibility up to the time when the Act came into force. It must be made perfectly clear that if licences were irresponsibly granted the Traffic Commissioners would not be bound by the action of the licensing authorities in the past.

Lieut.-Col. Ashley said that the Bill was a non-party Bill, and he hoped it would stand the test of time and be a model of legislation for the next twenty years.

The Bill was then read a third time.

## MISCELLANEOUS NEWS AND NOTES.

**Bank Holiday All-Night Tramcars.**—All-night tramcar services have been arranged by the Leicester Corporation to accommodate returning travellers.

**Conductors Refused Wage Increase.**—The Middlesbrough Tramways Committee has refused an application from omnibus conductors for an increase in wages.

**Omnibus Services at Peterborough.**—The tramway services of Peterborough Electric Traction Co., Ltd., to Dogsthorpe and Newark have been withdrawn and omnibus services substituted.

**Gateshead Tramways Company** has granted cheap fares for school children during the summer holidays. Special cars will be run one day in each week at 1d. fares for the return journey to Saltwell Park.

**Leeds Tramways Power Station.**—The question of scrapping the Leeds Tramways Department's power station at Crown Point, and the purchase of the whole of the supply from the Electricity Department, is to come under review in the near future.

**Plymouth Investigating the Trolleybus.**—A deputation from Plymouth Corporation is to visit Hastings, Nottingham, and Wolverhampton to inspect the trolleybus system in those cities with a view to the adoption of the system in Plymouth.

**Omnibuses for Wallasey.**—Wallasey Corporation proposes to replace all its tramcars by motor omnibuses within five years. The Tramways Committee has recommended that on the Warren-drive tramway route omnibuses should be substituted within a few months.

**Rochdale Corporation Bill,** which seeks to extend the radius in which the Corporation may run omnibuses and to abandon tramway routes and to substitute omnibuses, came before the Unopposed Bills Committee of the House of Lords last week and was passed for third reading.

**Scarborough Tramways.**—The Scarborough Town Clerk has presented to the local Transport Committee a report dealing with the Council's powers under the Tramways Act, 1870, with regard to the acquisition of the local tramways undertaking. The committee have decided that before they can make any further report they should know the Council's policy with regard to such acquisition.

**Southend Transport Improvement.**—At the last meeting of the Town Council Mr. W. J. Perrett (chairman of the Tramways Committee), in introducing the annual accounts for the year ending March 31, gave a comparison between the average financial results for the ten years ending March 31, 1929, and the results for the last year. The mileage run showed an increase of 288,315, and the passengers carried an increase of 2,203,293. There was a total increase in income of £2,763 and a reduction in working expenses of £1,296.

**Brighton Traffic Amalgamation.**—The Brighton Town Council on Thursday approved the proposal to amalgamate the public transport services from Portslade in the west to Rottingdean in the east. A Traffic Board is to be formed consisting of five members, two representing the Brighton Corporation, one representing Hove Corporation, and two representing Thomas Tilling, Ltd. Brighton Corporation is to hand over its tramways to the Board, and the Tilling Company will hand over its omnibuses. Hove Corporation, having neither tramcars nor omnibuses, will pay the Board £100,000 in cash for its share. The Board is to have power to borrow up to £500,000. It will be unable to substitute omnibus services for the existing tramways, or to increase the present tramway fares without the consent of Brighton Corporation. The employees are not to suffer through the amalgamation. Brighton and Hove Corporations will have the option of purchasing the undertaking at the end of fifteen years.

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**British Industries Fair.**—Prospectuses of the British Industries Fair, Birmingham, for 1931 have now been issued. The exhibition will be held at Castle Bromwich from February 16 to 27, and the Government has again agreed to a grant of £25,000 for publicity purposes. Intending exhibitors should communicate with the general manager at the Chamber of Commerce, 95, New-street, Birmingham.

**Experimental Tramcar for Edinburgh.**—The Public Utilities Committee of Edinburgh Corporation has approved the proposal of the transport manager (Mr. F. A. Fitzpayne) that £4,000 be spent on building an experimental tramcar. The manager stated that such a car would be a great asset in maintaining efficient services and would permit the introduction of all the latest ideas in construction and equipment.

**More Trolleybuses for St. Helens.**—St. Helens (Trolley Vehicles) Provisional Order Bill came before Lord Donoughmore (chairman of the Committees of the House of Lords) as an unopposed measure on July 17. The Bill, which has already passed the House of Commons, was ordered to be reported. By this Bill the St. Helens Corporation will obtain power to construct and maintain an extension of the present system for a distance of 2½ miles beyond the borough boundary.

**The Trolleybus at Leicester.**—Leicester Corporation will be given authority under the Bill which is now awaiting Royal Assent to introduce the trolleybus system. Alderman G. Banton (chairman of the Tramways Committee) is strongly in favour of the system on the Melbourne-road route. As the tracks in Leicester wear out advantage will probably be taken to equip some of the routes with the trolleybus system, but there is no intention of scrapping the tramways as a whole.

**Derby Traffic Committee.**—The Traffic Sub-Committee of Derby Corporation recommends that there should be one central omnibus station rather than several in different parts of the town. It proposes that the Corporation omnibuses should start from as near the central station as possible, and suggests that the abolition of the tramway system would materially help to speed up road traffic. The Committee assumes that the tramway system will be abolished when circumstances permit.

**Southport Tramways.**—A sub-committee of the Southport Tramways Committee has decided against the substitution of the tramways by omnibuses. The Committee consider that sufficient experience has not yet been gained to justify the change. They recommend, however, that tramcars should be taken off certain routes which are already covered to a certain extent by omnibus services, also introduction of several new routes, and the purchase of twelve new double-deck omnibuses.

**New London Underground Stations.**—The London Underground Railways Group propose to move Warren-street station, on the Hampstead and Highgate Tube, and reconstruct it at the corner of Tottenham Court-road. The new station will be only a few yards distant, but has to be reconstructed on account of the escalators which are to be installed. The cost will be about £250,000 and work is to begin in September. Chancery-lane and Edgware-road stations are also to be reconstructed and escalators installed, the object being to get as direct a line as possible from the booking-hall to the platform.

**British Road Transport Ahead of Continent.**—Councillor Brassington, chairman of Manchester Transport Committee, who attended the International Tramways Congress at Warsaw, has returned with an unfavourable impression of Continental tramways. He says that British tramways compare very favourably with the best on the Continent. The omnibus systems of Germany and other places he visited have a long way to go before they reach the efficiency of those in this country. Berlin is still running cumbersome vehicles with huge wheels, high steps and other features which disappeared from British omnibuses long ago. A novel feature in Berlin is the huge tenements for transport workers near the sheds.

**Future of Ayr Tramways.**—At the last meeting of Ayr Town Council a minute of the Tramways Committee with regard to the reconditioning of the cars stated that the manager had been authorised to accept the tender of the British Thomson-Houston Co. for motors and electrical equipment for three cars. He was to have two cars reseated by two of the firms which had sent in tenders, and when the work was completed the Committee would decide which firm should be employed for the other cars. The cost was to be about £120 per car. The Town Council disapproved the minute, and Treasurer Galloway said that at the next meeting he would move that a plebiscite be taken of the ratepayers as to whether they desired the tramway undertaking to be continued or not.

## PERSONAL.

**Motorman's Twenty-eight Years' Service.**—Mr. W. H. Brownridge retires this week after twenty-eight years' service with the Warrington Corporation Tramways. For the past eighteen years he has been a motorman. The staffs and employees of the electricity and tramways departments have presented him with an inscribed gold watch, the presentation being made by Mr. F. V. L. Mathias, the borough electrical and tramways engineer.

**Mr. H. Shorland,** who recently retired from the position of inspector in the Sheffield Corporation Tramways Department after thirty years' service, has been presented with a wallet of money from the Sheffield branch of the Transport and General Workers' Union. Councillor T. Garnett (vice-chairman of the Tramways Committee) made the presentation and said that Mr. Shorland had done much to build up the present tramway system.

**Mr. H. J. Sheppard** has been appointed managing director of Johnson & Phillips, Ltd., in succession to the late Mr. John MacGregor.

**Mr. F. J. Elliott,** of Bristol Corporation Electricity Department, has been appointed chief assistant electrical engineer of the Wolverhampton Corporation.

The late **Sir Alexander Gracie,** a director of the English Electric Co., Ltd., and Cammell Laird & Co., Ltd., left personal estate valued at £123,876, in addition to real estate.

**Mr. A. L. Lunn,** deputy chief engineer of Manchester Corporation Electricity Department, who, as recently announced, is to take up an important position with the London Underground, will assume his new duties in September.

**Mr. John Wilson, O.B.E.,** has been appointed traffic manager of the Buenos Aires Western Railway. He was at one time charge electrician of the Pinkston Power Station of Glasgow Corporation, and later became mains superintendent of the Aberdeen Corporation Electricity Department. Subsequently he filled other positions, being at one time resident engineer for the North Metropolitan Electrical Power Co. He was appointed electrical engineer of the Buenos Aires Western Railway in 1914.

**Mr. Edward Nolan,** who recently retired on account of his health from the post of traffic manager of the Scottish General Omnibus Co., has been presented with a wallet of Treasury notes and a pipe and case from the whole of the staff throughout Scotland. Mr. Nolan began as a conductor with the Falkirk and District Tramways Co., but gained promotion, and during the war was acting traffic superintendent. It is said that he was the first to introduce women tramcar drivers in Great Britain during the latter part of the war. Since 1919 Mr. Nolan has been engaged with the Glasgow Omnibus Co. He has continued his connection with the Falkirk Traction Co., formerly the Tramways Company, and will continue as manager.

We regret to record the death of **Mr. John MacGregor,** chairman and managing director of Johnson & Phillips, Ltd., which occurred on July 20. Mr. MacGregor was appointed managing director when Johnson & Phillips became a limited company in 1905, and in 1928 he became also chairman of the company.

## CONTRACTS.

**Siemens Electric Lamps & Supplies, Ltd.,** have received an order from the Metropolitan Water Board for gas-filled lamps for a period of twelve months.

**Crossley Motors, Ltd.,** Manchester, have received a second repeat order from Rochdale Corporation for six 32-seat 38-110 h.p. six-cylinder omnibuses and eight 50-seat "Condor" double-deckers.

**North London Tube Extension.**—The London Electric Railways have placed a contract with Cochrane & Co., Ltd., of Middlesbrough, for 35,000 tons of cast-iron segments required for the extension of the Piccadilly tube from Finsbury Park to Cockfosters, a distance of 7½ miles.

**The Vulcan Motor & Engineering Co.** have secured another order from the Hong-Kong and Shanghai Hotels, Ltd., for five Vulcan "Duchess" 26-seat omnibuses. This is the fourth repeat order from these hotels, which now run a fleet of 29 Vulcan omnibuses. The Vulcan Co. have also an order for eleven 3-5 ton subsidy type chassis and cabs from the War Office.

**Crossley Motors, Ltd.,** have received an order from the Crown Agents for the Colonies for 20/60 h.p. Crossley six-wheelers for the mechanisation of the King's African Rifles stationed at Nairobi and Dar-es-Salaam. Crossley Motors, Ltd., have previously supplied a number of six-wheelers for the mechanisation of the King's African Rifles stationed in Kenya.

**Southend-on-Sea Town Council** has accepted the following tenders:—The English Electric Co., Ltd., for one pair of motors; The British Thomson-Houston Co., Ltd., for one pair of controllers; The General Electric Co., Ltd., one pair each of motors and controllers, and 250 kw. rotary convertor and switchgear for Thorpe Bay sub-station.

## FINANCIAL.

**Dublin United Tramways.**—A dividend of 6 per cent. per annum on the preference shares is to be paid for the half-year ended June 30 last, but no interim dividend on the ordinary shares is being distributed. No dividends were paid on the ordinary shares for last year.

**National Omnibus Reconstruction.**—Sir John Jarvis, Bt., chairman of the National Omnibus & Transport Co., Ltd., has explained to a correspondent the proposed reconstruction scheme to reduce the capital from £1,000,000 to £450,000. The £550,000 is being returned because it is now only earning bank interest and shareholders should have the opportunity of investing it for themselves. The £500,000 preference shares will become £250,000 by the repayment of half this capital, and the ordinary shares will become £200,000 by the repayment of 12s. in the £. To attract the support of preference shareholders they are to be given an option to purchase one consolidated pound share for each £10 of preference capital repaid. Ordinary shareholders can convert each five shares of 8s. into two shares of 20s., so the same capital value remains. It is not proposed to reissue any of the shares recreated at present except in satisfaction of the options. The resolution is drawn so as to permit the capital to be reinstated as authorised capital without the payment of stamp fees. The meetings of shareholders are called for Monday, July 28.

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**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended July 23 amounted to £80,421, a decrease of £1,682 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to July 23 (16 2-7 weeks), the total receipts were £1,357,876, a decrease of £6,144.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended July 5 give total receipts of £440,938, or £16,654 more than in the corresponding week of last year. The aggregate receipts for fourteen weeks amounted to £5,926,132, an increase of £139,802 over the corresponding period of last year.

**Salford Municipal Transport department** shows a loss of £14,562 for the past year. The omnibus services show a profit of £4,266 and on the tramway services there is a loss of £18,788. The Tramways and Motor Omnibus Committee say they have been obliged by competition to concentrate on the omnibus services to the detriment of the tramways.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name. | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | July 22 | 579 | 534 | − 45 | 16 | 9,163 | − 233 |
| „ Motor Buses ... | „ 22 | 222 | 301 | + 79 | 16 | 4,650 | + 689 |
| „ Total ... ... | „ 22 | 801 | 835 | + 34 | 16 | 13,813 | + 456 |
| Aberdeen Corp. ... | „ 16 | 7,469 | 5,483 | − 1,986 | 6½ | 35,740 | − 326 |
| Ashton-u-Lyne Corp. | „ 12 | 942 | 828 | − 114 | 15 | 12,813 | − 947 |
| „ Motor Buses ... | „ 12 | 500 | 496 | − 4 | 15 | 7,523 | + 41 |
| „ Trolley Buses ... | „ 12 | 285 | 243 | − 42 | 15 | 3,957 | − 294 |
| „ Total ... ... | „ 12 | 1,727 | 1,567 | − 160 | 15 | 24,293 | − 1,200 |
| Ayr Corporation ... | „ 19 | 1,669 | 734 | − 935 | 9 | 5,470 | − 1,293 |
| Barrow Corporation... | „ 15 | 623 | 586 | − 37 | 15 | 8,717 | − 509 |
| „ Motor Buses ... | „ 13 | 433 | 440 | + 7 | 15 | 5,967 | − 1,057 |
| „ Total ... ... | „ 13 | 1,056 | 1,026 | − 30 | 15 | 14,684 | − 1,566 |
| Belfast City ... ... | „ 18 | 11,150 | 9,701 | + 449 | 15½ | 180,594 | + 6,758 |
| „ Motor Buses ... | „ 18 | 832 | 1,065 | + 233 | 15½ | 20,959 | + 4,444 |
| „ Total ... ... | „ 18 | 10,982 | 10,766 | + 216 | 15½ | 201,553 | + 11,199 |
| Birkenhead Corp. ... | „ 26 | 1,741 | 1,544 | − 197 | 16 | 25,301 | − 1,833 |
| „ Motor Buses ... | „ 26 | 4,048 | 3,522 | − 526 | 16 | 57,092 | + 3,466 |
| „ Total ... ... | „ 26 | 5,789 | 5,066 | − 723 | 16 | 82,393 | + 1,633 |
| Birmingham Corp. ... | „ 15 | 27,024 | 26,504 | − 1,060 | 15 | 405,757 | − 5,268 |
| „ Motor Buses ... | „ 15 | 13,464 | 15,485 | + 2,021 | 15 | 233,811 | + 41,948 |
| „ Trolley Buses ... | „ 15 | 569 | 556 | − 13 | 15 | 8,433 | + 126 |
| „ Total ... ... | „ 15 | 41,657 | 42,005 | + 948 | 15 | 648,001 | + 36,806 |
| Blackburn Corp. ... | „ 16 | 2,203 | 1,918 | − 285 | 15½ | 28,707 | − 1,788 |
| „ Motor Buses ... | „ 16 | Nil | 323 | + 323 | 15½ | 4,931 | + 4,931 |
| „ Total ... ... | „ 16 | 2,203 | 2,241 | + 38 | 15½ | 33,638 | + 3,143 |
| Bradford Corporation | „ 19 | 15,357 | 15,342 | − 15 | 16 | 228,469 | − 6,961 |
| Brighton Corporation | „ 20 | 3,032 | 2,841 | + 191 | 15½ | 42,515 | + 2,067 |
| Burnley Corporation... | „ 19 | 2,949 | 2,822 | − 127 | .. | ... | ... |
| „ Motor Buses ... | „ 19 | 660 | 707 | + 47 | ... | ... | ... |
| „ Total ... ... | „ 19 | 3,609 | 3,529 | − 80 | ... | ... | ... |
| Burton-on-Trent Corp. | „ 20 | 871 | 873 | + 2 | 16 | 13,510 | + 811 |
| Bury Corporation ... | „ 20 | 2,061 | 1,802 | − 259 | 15½ | 29,319 | − 4,089 |
| „ Motor Buses ... | „ 20 | 422 | 1,098 | + 676 | 15½ | 17,398 | + 11,065 |
| „ Total ... ... | „ 20 | 2,483 | 2,900 | + 417 | 15½ | 46,717 | + 6,976 |
| Cardiff Corporation ... | „ 19 | 7,862 | 7,868 | + 6 | 15½ | 123,539 | + 2,868 |
| Chatham and District | „ 17 | 1,393 | 1,226 | − 167 | 28 | 31,693 | + 1,248 |
| Chester Corporation ... | „ 20 | 456 | Nil | − 456 | 16 | Nil | − 7,183 |
| „ Motor Buses ... | „ 20 | Nil | 707 | + 707 | 12 | 10,479 | + 10,479 |
| „ Total ... ... | „ 20 | 456 | 707 | + 251 | 16 | 10,479 | + 3,296 |
| Chesterfield Corp. ... | „ 21 | 1,862 | 1,879 | + 17 | 16 | 29,809 | + 1,093 |
| Colchester Corp. ... | „ 23 | 566 | 649 | + 83 | 17 | 10,082 | + 1,145 |
| Colne Corporation ... | „ 16 | 808 | 692 | − 116 | 15 | 10,930 | + 55 |
| Coventry Corporation | „ 20 | 2,074 | 1,925 | − 149 | 16 | 32,540 | − 1,979 |
| „ Motor Buses ... | „ 20 | 1,574 | 1,749 | + 175 | 16 | 29,179 | + 3,986 |
| „ Total ... ... | „ 20 | 3,648 | 3,674 | + 26 | 16 | 61,719 | + 2,007 |
| Darlington Corp. ... | „ 19 | 992 | 1,089 | + 97 | 15½ | 16,878 | + 1,593 |
| Derby Corporation ... | „ 19 | 2,587 | 2,437 | − 150 | 16 | 39,039 | − 616 |
| „ Motor Buses ... | „ 19 | 782 | 931 | + 149 | 16 | 14,535 | + 3,654 |
| „ Total ... ... | „ 19 | 3,369 | 3,368 | − 1 | 16 | 53,574 | + 3,038 |
| Dover Corporation ... | „ 19 | 495 | 459 | − 36 | 16 | 6,429 | + 236 |
| Dundee Corporation... | „ 8 | 2,542 | 2,580 | − 38 | 7½ | 20,266 | − 544 |
| „ Motor Buses ... | „ 8 | 804 | 1,164 | + 360 | 7½ | 7,961 | + 1,456 |
| „ Total ... ... | „ 8 | 3,346 | 3,744 | + 398 | 7½ | 28,227 | + 912 |
| East Ham Corp. ... | „ 19 | 2,281 | 2,280 | − 1 | 14½ | 36,599 | + 913 |
| Edinburgh Corp. ... | „ 12 | 14,974 | 15,572 | + 598 | 8½ | 132,477 | − 2,989 |
| „ Motor Buses ... | „ 12 | 3,611 | 3,934 | + 323 | 8½ | 33,976 | + 3,136 |
| „ Total ... ... | „ 12 | 18,585 | 19,506 | + 921 | 8½ | 166,453 | + 6,125 |
| Exeter Corporation ... | „ 16 | 909 | 855 | − 54 | 16 | 12,895 | − 570 |
| „ Motor Buses ... | „ 16 | 163 | 300 | + 137 | 16 | 4,422 | − 2,505 |
| „ Total ... ... | „ 16 | 1,072 | 1,155 | + 83 | 16 | 17,317 | − 1,935 |
| Glasgow Corporation... | June 28 | 46,055 | 45,219 | − 836 | 4 | 183,870 | + 3,175 |
| „ Motor Buses ... | „ 28 | 5,355 | 8,696 | + 3,341 | 4 | 34,758 | + 13,500 |
| „ Total ... ... | „ 28 | 51,410 | 53,915 | + 2,505 | 4 | 218,628 | + 16,675 |
| Gloucester Corp. ... | July 16 | 606 | 725 | + 119 | 15½ | 10,881 | + 2,461 |
| Grimsby Corporation | „ 19 | 1,476 | 1,620 | + 144 | 16 | 24,418 | + 3,096 |
| Halifax Corporation | „ 15 | 4,798 | 5,277 | + 479 | 15½ | 79,235 | + 9,482 |
| Huddersfield Corp. ... | „ 19 | 6,591 | 6,398 | − 193 | 16 | 102,217 | − 1,368 |
| Hull Corporation ... | „ 19 | 5,836 | 5,709 | − 127 | 16 | 91,445 | − 997 |
| „ Motor Buses ... | „ 19 | 1,352 | 2,036 | + 684 | 16 | 23,748 | + 2,923 |
| „ Total ... ... | „ 19 | 7,188 | 7,745 | + 557 | 16 | 115,193 | + 1,926 |
| Ilford Corporation ... | „ 19 | 1,477 | 1,582 | + 105 | 15½ | 24,301 | + 606 |
| Ipswich Corp. Trol.Bus | „ 19 | 1,309 | 1,383 | + 74 | 15½ | 21,037 | + 1,263 |
| Isle of Thanet ... | „ 16 | 1,718 | 1,461 | − 257 | 28½ | 17,190 | − 788 |
| Kilmarnock Corp. ... | „ 12 | 475 | 486 | + 11 | 8½ | 4,122 | + 166 |
| Lancashire Un. ... | „ 13 | 2,036 | 1,942 | − 94 | 27½ | 59,657 | − 2,725 |
| „ Motor Buses ... | „ 13 | 4,738 | 5,202 | + 464 | 27½ | 133,359 | + 19,417 |
| Leeds Corporation ... | „ 19 | 20,961 | 20,751 | − 210 | 15½ | 320,488 | + 9,851 |
| Leicester Corp. ... | „ 19 | 8,614 | 8,506 | − 108 | 16 | 133,623 | + 1,549 |
| Lincoln Corp. ... | „ 20 | 957 | 919 | − 38 | 16 | 14,840 | + 41 |
| Liverpool Corp. ... | „ 19 | 31,862 | 29,815 | − 2,047 | 15½ | 478,037 | + 3,864 |
| London County Coun. | „ 23 | 82,103 | 80,421 | − 1,682 | 16½ | 1,357,876 | − 6,144 |
| Luton Corporation ... | „ 16 | 446 | 431 | − 15 | 15½ | 6,731 | + 382 |
| Maidstone Corp. ... | „ 17 | 237 | Nil | − 237 | 15½ | Nil | − 3,852 |
| „ Motor Buses ... | „ 17 | 286 | 276 | − 10 | 15½ | 4,332 | − 30 |
| „ Trolley Buses ... | „ 17 | 304 | 577 | + 273 | 15½ | 9,688 | + 4,893 |
| „ Total ... ... | „ 17 | 827 | 853 | + 26 | 15½ | 14,020 | + 1,071 |
| Manchester Corp. ... | „ 12 | 36,211 | 34,311 | − 1,900 | 15 | 481,664 | − 41,270 |
| „ Motor Buses ... | „ 12 | 5,349 | 9,362 | + 4,013 | 15 | 128,392 | + 54,033 |
| „ Total ... ... | „ 12 | 41,560 | 43,673 | + 2,113 | 15 | 610,056 | + 12,763 |
| Middlesbrough Corp. | „ 8 | 1,106 | 1,123 | + 17 | 14½ | 15,110 | − 833 |
| „ Motor Buses ... | „ 8 | 510 | 611 | + 101 | 14½ | 8,110 | + 945 |
| „ Total ... ... | „ 8 | 1,616 | 1,734 | + 118 | 14½ | 23,220 | + 112 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks. | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty.Corp. | July 19 | 10,293 | 8,603 | − 1,690 | 15½ | 139,666 | − 18,638 |
| „ Motor Buses ... | „ 19 | 2,217 | 3,205 | + 988 | 15½ | 47,499 | + 15,132 |
| „ Total ... ... | „ 19 | 12,510 | 11,808 | − 702 | 15½ | 187,165 | − 3,506 |
| Newport Corporation | „ 12 | 752 | 783 | + 31 | 15 | 12,110 | + 1,026 |
| „ Motor Buses ... | „ 12 | 1,692 | 1,564 | − 128 | 15 | 23,882 | − 806 |
| „ Total ... ... | „ 12 | 2,444 | 2,347 | − 97 | 15 | 35,992 | + 220 |
| Northampton Corp. ... | „ 18 | 1,093 | 1,069 | − 24 | 15½ | 17,181 | − 381 |
| „ Motor Buses ... | „ 18 | 693 | 724 | + 31 | 15½ | 11,378 | + 1,319 |
| „ Total ... ... | „ 18 | 1,786 | 1,793 | + 7 | 15½ | 28,559 | + 938 |
| Nottingham Corp. ... | „ 17 | 6,961 | 5,835 | − 1,126 | 15½ | 90,335 | − 12,423 |
| „ Motor Buses ... | „ 17 | 2,271 | 3,384 | + 1,113 | 15½ | 51,398 | + 16,469 |
| „ Trolley Buses ... | „ 17 | 594 | 1,212 | + 618 | 15½ | 18,700 | + 9,478 |
| „ Total ... ... | „ 17 | 9,826 | 10,431 | + 605 | 15½ | 160,433 | + 13,524 |
| Oldham Corporation | „ 19 | 3,757 | 3,320 | − 437 | 17 | 56,834 | − 4,389 |
| „ Motor Buses ... | „ 19 | 2,273 | 1,952 | − 321 | 17 | 34,104 | − 648 |
| „ Total ... ... | „ 19 | 6,030 | 5,272 | − 758 | 17 | 90,938 | − 5,037 |
| Plymouth Corp. ... | „ 19 | 4,575 | 3,715 | − 860 | 15½ | 57,447 | − 1,817 |
| „ Motor Buses ... | „ 19 | 2,143 | 2,495 | + 352 | 15½ | 37,806 | + 7,913 |
| „ Total ... ... | „ 19 | 6,718 | 6,210 | − 508 | 15½ | 95,253 | + 6,096 |
| Portsmouth Corp. ... | „ 19 | 5,322 | 4,625 | − 697 | 16 | 63,490 | − 5,047 |
| „ Motor Buses ... | „ 19 | 2,320 | 3,683 | + 1,363 | 16 | 51,798 | + 21,096 |
| „ Total ... ... | „ 19 | 7,642 | 8,308 | + 666 | 16 | 115,288 | + 16,049 |
| Preston Corporation... | „ 16 | 1,853 | 1,705 | − 48 | 15½ | 25,590 | − 1,243 |
| „ Motor Buses ... | „ 16 | 493 | 548 | + 55 | 15½ | 7,924 | + 539 |
| „ Total ... ... | „ 16 | 2,346 | 2,253 | − 7 | 15½ | 33,514 | − 704 |
| Rawtenstall Corp. ... | „ 20 | 868 | 676 | − 192 | 15½ | 10,720 | − 3,085 |
| „ Motor Buses ... | „ 20 | 574 | 717 | + 143 | 15½ | 11,190 | + 2,601 |
| „ Total ... ... | „ 20 | 1,442 | 1,393 | − 49 | 15½ | 21,910 | − 484 |
| Reading Corporation | „ 17 | 1,575 | 1,455 | − 120 | 15 | 22,441 | − 817 |
| „ Motor Buses ... | „ 17 | 938 | 984 | + 46 | 15 | 15,874 | + 1,844 |
| „ Total ... ... | „ 17 | 2,513 | 2,439 | − 74 | 15 | 38,315 | + 1,027 |
| Rochdale Corp. ... | „ 19 | 3,205 | 2,884 | − 321 | ... | 44,297 | − 3,917 |
| „ Motor Buses ... | „ 19 | 1,678 | 1,573 | − 105 | ... | 25,113 | + 621 |
| „ Total ... ... | „ 19 | 4,883 | 4,457 | − 426 | ... | 69,410 | − 3,296 |
| Rotherham Corp. ... | „ 14 | 2,608 | 2,632 | + 24 | 15 | 41,586 | + 2,034 |
| Salford Corporation ... | „ 20 | 11,360 | 10,758 | − 602 | 15½ | 180,624 | + 2,709 |
| Sheffield Corp. ... | „ 19 | 21,659 | 20,246 | − 1,413 | 15½ | 330,874 | − 3,315 |
| Southampton Corp. ... | „ 16 | 3,652 | 3,637 | − 15 | 16 | 53,126 | + 1,224 |
| „ Motor Buses ... | „ 16 | 852 | 907 | + 55 | 16 | 13,607 | + 2,235 |
| „ Total ... ... | „ 16 | 4,504 | 4,544 | + 40 | 16 | 66,733 | + 3,459 |
| Southend-on-Sea Corp. | „ 23 | 2,776 | 2,390 | − 386 | 16½ | 34,891 | − 1,408 |
| „ Trolley Buses... | „ 23 | 192 | 354 | + 162 | 16½ | 4,867 | + 2,321 |
| „ Total ... ... | „ 23 | 2,968 | 2,744 | − 224 | 16½ | 39,758 | + 913 |
| Southport Corp. ... | „ 19 | 1,514 | 1,447 | − 67 | 15½ | 21,093 | − 76 |
| „ Motor Buses ... | „ 19 | 460 | 458 | − 2 | 15½ | 6,709 | + 737 |
| „ Total ... ... | „ 19 | 1,974 | 1,905 | − 69 | 15½ | 27,802 | + 661 |
| St. Helens Corp. ... | „ 15 | 2,000 | 2,032 | + 32 | 15½ | 30,902 | + 2,116 |
| Sunderland Corp. ... | „ 22 | 2,800 | 2,470 | − 330 | 16 | 40,432 | + 1,404 |
| „ Motor Buses ... | „ 22 | 373 | 571 | + 198 | 16 | 8,330 | + 5,674 |
| „ Total ... ... | „ 22 | 3,173 | 3,041 | − 132 | 16 | 48,762 | + 7,078 |
| Swindon Corp. .. | „ 16 | 868 | 886 | + 18 | 15½ | 15,136 | + 3,971 |
| Wallasey Corp. ... | „ 19 | 1,624 | 1,278 | − 346 | 15½ | 19,953 | − 1,522 |
| „ Motor Buses ... | „ 19 | 2,729 | 2,496 | + 233 | 15½ | 37,215 | + 4,132 |
| „ Total ... ... | „ 19 | 4,353 | 3,774 | + 579 | 15½ | 57,168 | + 3,610 |
| Walsall Corporation... | „ 13 | 3,325 | 3,214 | − 111 | 15 | 52,243 | + 1,642 |
| Walthamstow Corp. ... | „ 19 | 2,588 | 2,493 | + 95 | 15½ | 39,586 | + 208 |
| Warrington Corp. ... | „ 17 | 860 | 851 | − 9 | 16 | 14,152 | + 20 |
| „ Motor Buses ... | „ 17 | 428 | 479 | + 51 | 16 | 8,022 | + 959 |
| „ Total ... ... | „ 17 | 1,288 | 1,330 | + 42 | 16 | 22,174 | + 979 |
| West Ham Corp. ... | „ 17 | 5,926 | 5,900 | − 26 | 15½ | 95,221 | + 2,549 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | „ 13 | 2,701 | 2,371 | − 330 | 15 | 36,626 | − 5,468 |
| „ Trolley Buses ... | „ 13 | 3,306 | 3,359 | + 53 | 15 | 53,169 | + 3,593 |
| „ Total ... ... | „ 13 | 6,007 | 5,730 | − 277 | 15 | 89,795 | − 1,875 |
| York Corporation ... | „ 16 | 1,323 | 1,068 | − 255 | 16 | 16,218 | + 354 |
| „ Motor Buses ... | „ 16 | 419 | 527 | + 108 | 16 | 7,817 | + 2,138 |
| „ Trolley Buses ... | „ 16 | 64 | Nil | − 64 | 16 | Nil | − 792 |
| „ Total ... ... | „ 16 | 1,806 | 1,595 | + 211 | 16 | 24,035 | + 1,700 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or *M* | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | July 22 | £81,437 | £74,314 | 29 w | £2,421,471 | − £96,671 |
| Brazilian Traction $ | June | 4,210,893 | 4,146,884 | 6 m | 24,286,359 | + 249,334 |
| British Columbia $ | May | 1,165,279 | 1,203,292 | 11 m | 13,514,147 | + 599,302 |
| Buenos Aires Lacroze | July 20 | 11,495 | 9,603 | 3 w | 29,625 | − 4,722 |
| Burma E. Sup. Co. Rs. | June | 63,157 | 66,317 | 11 m | 709,845 | − 18,866 |
| Calcutta ... Rs. | July 19 | 128,680 | 103,723 | 28½ w | 3,230,392 | − 427,462 |
| Cape Town ... ... | May | 29,366 | 27,286 | ... | ... | ... |
| Carthagena & Herrerias | June | 1,476 | 515 | 6 m | 5,612 | − 209 |
| Durban ... ... | May | 24,518 | 23,945 | 10 m | 238,483 | − 714 |
| East India ... ... | June | 3,772 | 3,803 | 11 m | 41,627 | + 438 |
| Kalgoorlie ... ... | Apr. | 1,673 | 1,718 | 4 m | 6,319 | Nil |
| Madras (2 weeks) Rs. | July 15 | 50,308 | 52,435 | 26 w | 600,966 | + 30,600 |
| Para ... ... | June | 15,450 | 15,028 | 7 m | 103,807 | + 749 |
| Port Elizabeth ... | May | 7,601 | 7,552 | ... | ... | ... |
| Rangoon ... Rs. | June | 114,535 | 142,170 | 6 m | 899,635 | + 190,824 |
| Shanghai ... $ | June | 335,740 | 367,231 | 6 m | 1,923,202 | − 42,708 |
| Singapore ... ...$ | June | 123,000 | 140,000 | 9 m | 1,223,000 | + 140,000 |
| Winnipeg ... ...$ | May | 534,954 | 509,709 | 5 m | 2,793,546 | − 28,794 |

## RAILWAY RECEIPTS.

| 29th Week ended July 20th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 295,000 | − 15,000 | 307,000 | − 36,000 | 602,000 | − 51,000 | − 671,000 |
| L.M S R. | 706,000 | − 5,000 | 716,000 | − 62,000 | 1,422,000 | − 67,000 | −2,011,000 |
| L.N.E R. | 467,000 | − 17,000 | 600,000 | − 45,000 | 1,067,000 | − 62,000 | −1,090,000 |
| S.R. | 385,000 | − 18,000 | 104,000 | − 5,000 | 489,000 | − 23,000 | − 164,000 |
| Totals | 1,853,000 | − 55,000 | 1,727,000 | − 148,000 | 3,580,000 | − 203,000 | −3,936,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or − | Aggregate. 1930. | + or − |
|---|---|---|---|---|---|---|
| LONDON UNDERGROUND | | | | | | |
| Common Fund Cos. | July 19 | 303,600 | 307,000 | + 3,400 | 8,764,100 | + 573,300 |
| Lond. & Sub. Group | „ 19 | 45,900 | 45,900 | Nil | 1,279,100 | + 97,900 |
| METROPOLITAN RAILWAY | „ 19 | 36,400 | 36,600 | + 200 | 1,067,100 | + 24,900 |
| LIVERPOOL OVERHEAD | „ 20 | 1,820 | 1,544 | − 276 | 44,501 | + 2,671 |
| MERSEY RAILWAY ... | „ 19 | 4,089 | 4,253 | + 164 | 133,106 | + 4,284 |

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LONDON, AUGUST 2, 1930.

## THE NEW ERA OF ROAD TRANSPORT.

In three months the new Road Traffic Act will begin to operate and vast changes in the road transport of this country will be inaugurated. Mr. Morrison, the Minister of Transport, announced the dates of operation for the various sections in the House of Commons on Wednesday. Great administrative changes are involved, and it will take some time for the necessary arrangements to be completed; but Mr. Morrison is confident of being able to adhere to these dates, which will be found on another page. The law relating to speed limits does not change until January 1, 1931, and Part V. of the Act, dealing with the operation of municipal omnibus services, comes into force on the same date, as does the insurance against third-party risks, when the licensing year for motor vehicles begins. The sections which operate as from November 1 next deal with the new form of driving licence and physical fitness, the highways law, and the regulation of public service vehicles, which provides the machinery for the appointment of the Traffic Commissioners, etc. The requirement, however, that omnibus and motor-coach services cannot be operated except under a road service licence granted by the Commissioners will not become operative until March 1, 1931, at the earliest. There was one important difference between the two Houses of Parliament—the clause relating to wages and conditions of employment in connection with public service vehicles. The Lords threw this clause out of the Bill, but the Commons insisted on its retention, and finally, on Wednesday, the Lords gave way. It now remains to be seen how far this new Act will go in improving the conditions of road transport and securing the safety and convenience of the public; but, at any rate, it should in due course bring order out of the present chaos by introducing a necessary co-ordination of road transport and substituting an improved system of licensing for the present multiplicity of authorities. Mr. Morrison is to be congratulated on his tactful conduct of the Bill, and particularly on his reasonableness in accepting various amendments, with some of which he was not in full agreement. His success in securing the passing of the Act has, indeed, won for him praise from all parties.

## BERLIN TRAFFIC COMPANY.

The Berlin correspondent of "The Times" contributed the following despatch to Friday's issue:—

The important part which is coming to be played in international affairs by British accountancy is shown by the prominent publication in the Berlin Press of a report of Messrs. Price, Waterhouse and Co. upon the finances of the Berlin Traffic Company. The newspapers do not state how they obtained access to the report, which was a confidential one supplied by the chartered accountants to the company. They simply publish it with the statement that "the public ought to know about it." In it Messrs. Price, Waterhouse declined, for specified reasons, to certify the balance sheet of the company, which has since been published.

The Berlin Traffic Company is probably one of the largest municipal undertakings in the world. It combines the whole of the city's omnibus, tramway, and underground services, which each began as private undertakings, gradually came under municipal control, and were amalgamated at the end of 1928 in the one company with a capital of £20,000,000.

This year's balance sheet and report cover the first year's working as a combined undertaking. The balance sheet showed a profit of about 12,000,000m. (£600,000). The report spoke of falling traffic figures and declining income, in spite of heavy increases in fares, and hinted at the necessity for a loan. It has been known for some time that the company contemplated raising a foreign loan, but the arrangements were never completed.

A memorandum by Messrs. Price, Waterhouse, dated May 22, makes the following criticisms of the balance sheet:—

(1) The grouping of assets and liabilities "does not accord with modern ideas of accountancy, and is in some cases unclear"; (2) the description accorded to various groups of assets affords inadequate information about the basis of their valuation in the company's books; (3) the profit and loss account includes various items not falling within the year, so that the company's results are valued too high.

The Berlin Traffic Company states that certain alterations in the sense of those suggested were made before the balance sheet was issued.

## L.C.C. TRAMWAY MATTERS.

At the meeting of the London County Council on Tuesday, the last meeting before the summer session, various reports of the Highways Committee were approved.

### COMMERCIAL MANAGER AND TRAMWAYS ACCOUNTANT.

On July 22 the Council decided to abolish the positions of traffic manager, and accountant and chief clerk, and to create the positions of commercial manager and tramways accountant. The salary of the commercial manager is to be £1,800, increasing to £2,000, and of the accountant £900, increasing to £1,100. New scales of salary were also approved for the position of traffic operation superintendent at £1,200, increasing to £1,500, and development superintendent at £1,100, increasing to £1,300. The committee recommended the following appointments: Mr. G. H. Brooks, accountant and chief clerk, to be promoted to position of commercial manager, at a commencing salary of £1,800. Mr. S. R. Geary, traffic operating superintendent in the tramways department, to be placed on the new scale of salary attached to the position commencing at £1,200. Mr. F. Scothorne, development superintendent in the tramways department, to be placed on the new scale of salary attaching to the position at the commencing salary of £1,100. Mr. F. J. Geary, principal assistant, to be promoted to tramways accountant at a commencing salary of £900.

### MACHINE TOOLS FOR CENTRAL REPAIR SHOP.

The Highways Committee recommended the purchase of additional machinery for the Central Repair Depot, including bar-cutting machines, four-spindle drilling and tapping machines, power hacksaw, 5½-in. capstan lathes, 6½-in. capstan lathes, two welding machines, a pump and receiver at an estimated cost of £2,630. They also recommended the installation of a grit collector apparatus at an estimated cost of £900, so as to avoid the deposition of grit from the boiler chimney on the adjacent roofs.

The Committee also recommended that the doubling of the track from Murdock Cottages to Mile End-road should be undertaken at an estimated cost of £2,000.

### MECHANICAL TRANSPORT VEHICLES.

The Highways Committee have under consideration the desirability of replacing the number of transport vehicles in use in the tramways department which have been in service for periods varying from 10 to 23 years. At present there are in the tramways department 18 steam lorries purchased between 1907 and 1920. The tramways department have also three 28 h.p. Landaulette type cars which should be replaced. The Committee proposed that 14 vehicles should be purchased at a cost not exceeding £9,790.

### STATIONS ON THE ALDWYCH SUBWAY.

The Committee has decided to modernise and redecorate the Aldwych and Holborn stations on the subway, so that the appearance might prove as attractive to the passengers as most of the underground railway stations. A scheme of lighting and redecorating will be undertaken at an estimated cost of £6,000.

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## THE ROAD TRAFFIC ACT.

### DATES FOR COMING INTO OPERATION.

Mr. Herbert Morrison, the Minister of Transport, in the House of Commons on Wednesday gave approximate dates on which the various parts of the Road Traffic Act will come into operation. The information was given in reply to questions by Colonel Howard-Bury and Mr. D. G. Somerville. Mr. Morrison's statement was as follows :—

A number of regulations have to be made and machinery has to be set up before the Road Traffic Act can be brought fully into operation. A statutory obligation is also placed on me to consult with representative bodies before any regulations are made. I cannot therefore, at the moment, although I am most anxious to avoid any unnecessary delay, give a definite undertaking as to the dates on which the various provisions of the Act will become operative. The dates which I have in mind and to which I shall work, are approximately as follows :—

Part I.—I have given anxious consideration to the question of the date at which the change in the law as to speed limits can most conveniently operate and have come to the conclusion that this should be January 1 next. By that date I hope that it may be possible to issue the Highway Code and local authorities will have had reasonable time to consider and arrange for the organisation of mobile police units as contemplated by the provisions of the Act. As regards the remainder of Part I, I have in mind the first of November. It would hardly be practicable to make the necessary Regulations with regard to the form of the driving licence and applications for licences and declarations as to physical fitness, and also to make arrangements for these documents to be printed in large numbers and made available for licensing authorities before that date.

Part II, which deals with cover against third party risks, should come into operation on January 1, 1931, the date which is the beginning of the licensing year for motor vehicles.

Part III (amendment of the law relating to highways) on November 1, 1930.—I attach great importance to the highway code, and shall lose no time in bringing it into force, but as it will affect all classes of road users whose views I shall have to take into account, and as in addition it requires an affirmative resolution by both Houses before coming into force, it is impossible for me to indicate precisely the date on which the code will itself become operative.

Part IV (Regulation of Public Service Vehicles).— I propose that the sections of this part of the Act, which provide the necessary machinery for the appointment of the Traffic Commissioners, etc., should come into force on November 1 ; as also the sections giving the Traffic Commissioners when appointed the necessary powers to execute their duties, consider applications for licences, etc. The requirement, however, that omnibus and motor coach services cannot be operated except under a road service licence granted by the Commissioners will not become operative before March 1, 1931, at the earliest. The bringing into force of this part of the Act will necessitate the employment of my powers to make transitory provisions.

Part V of the Act, which deals with the operation of municipal omnibus services, I propose shall come into force on January 1 next.

I should point out that it may be necessary to postpone the operation of individual sections of the Act.

### OPERATION OF MUNICIPAL SERVICES.

The amendments made by the Commons to the Bill had been considered by the House of Lords on July 25. Earl Russell explained that the new Part V of the Bill, empowering local authorities which already possessed powers to run public service vehicles to extend these services inside or outside their districts without having to seek special authority from Parliament, had been inserted by the Commons in place of the original Part V which the Lords had struck out. The new Part V was the result of a compromise with the parties concerned- the local authorities, parties who run service vehicles, the railway companies, and the political parties. Viscount Brentford said that considerable modifications had been made in Part V, and he would raise no further objections. The Commons' amendment was then agreed to.

### THE FAIR WAGES CLAUSE.

Viscount Brentford moved to disagree with the new clause providing that the wages paid to persons employed in connection with the operation of a public service vehicle and their conditions of employment should not be less favourable than those which would have to be observed in a contract which complied with the Fair Wages Resolution of the House of Commons, applicable to a Government Department. He said that he knew of no Act which sought to enforce the Fair Wages Clause upon private undertakings. He regarded the clause as quite unjustifiable. Earl Russell said a similar provision was put into the Housing Act, 1924, and related to both public and private undertakings. He did not think it wise for their Lordships to raise an issue where their action was liable to be misunderstood. The Marquis of Salisbury said that the clause violated one of the main principles of private enterprise, and it would be impossible for the majority of their Lordships to accept so great a change in public policy under such conditions. The motion to disagree with the clause was agreed to.

On July 29 the House of Commons agreed not to insist upon certain amendments with which the Lords had disagreed. Mr. Morrison said they were largely amendments of form which were acceptable to the Government.

With regard to the amendment made by the Lords to reject the clause relating to wages and conditions of employment, Mr. Morrison moved that the House insist upon the retention of the clause. He said it was a matter of some surprise that their Lordships should disagree on the clause, which was agreed to in Committee without a division, and was not changed on the report stage except in a matter of wording. It had been argued that this clause provided for interference with private enterprise. As a matter of fact there were precedents for this decision in one of the Housing Acts and in the Beet-Sugar Act. It had been the custom to insert a Fair Wages Clause in Government contracts. They had to face the fact that there was being set up, partly regulated by municipalities and partly by companies, a monopoly of road transport, and it was right that between one operator and another there should be reasonable competition. It was fair to the great bulk of employers that they should not be cut out by employers who imposed strained conditions. Further, the great body of public servants who conduct and drive the services should be efficient, properly fed and work under reasonable conditions. That was necessary and desirable in the interests of public safety. They were supported by the Royal Commission on Transport, who in their report said : " We also recommend that the commissioners should be empowered to attach conditions relating to hours, wages and conditions of service. We consider that these matters may have, in many cases, a direct bearing on the safety of the public."

Col. Ashley said he was glad that the Minister had moved to disagree with the Lords in this respect. Undoubtedly a great deal of labour engaged in this transportation work was underpaid, and the amendment would not harm the good employer, but simply bring up the bad employer.

The House agreed to insist upon their amendment.

When the clause was again considered by the Lords on Wednesday, Earl Russell said this was the only amendment of their Lordships which the Commons had disagreed with. He read an extract from the speech of Col. Ashley in the House of Commons, mentioned above. Viscount Brentford said that Col. Ashley's speech was entirely uncalled for and quite wrong.

The motion to re-insert the clause was then agreed to without a division. Subsequently the Bill received the Royal Assent.

## ENGLISH ELECTRIC COMPANY.

### APPOINTMENT OF NEW CHAIRMAN.

Sir Holberry Mensforth has been elected a director of the English Electric Company, and appointed chairman of the board. Mr. W. L. Hichens, who in October last accepted the chairmanship as a temporary arrangement, has resigned that office and retired from the board, now that the reconstruction of the company has been completed.

## PERSONAL.

**Mr. A. H. Shaw,** borough electrical engineer of Ilford Corporation, has been granted an increase in salary to £1,275 per annum.

**Sir George Hume,** who recently resigned his membership of the Highways Committee of the London County Council, had served on the Committee continuously over a period of twenty years. During five years 1914-19 he was Chairman of the Committee. Throughout his long connection with the undertaking he gave invaluable service, and the Highways Committee recently recorded their high appreciation of his services.

**Mr. E. Kilburn Scott** received injuries which fortunately were not serious while travelling recently in a motor coach from London to Leeds to attend the presentation of a Matthew Murray model locomotive to the Leeds Museum. The coach skidded on a greasy road and collided with a tramcar of the Doncaster Corporation. Mr. Scott, who received cuts on the head, was able to leave the hospital the next day and to attend the presentation ceremony, when he received the congratulations of the Lord Mayor of Leeds on his escape from serious injury.

## FINANCIAL.

**Cardiff Corporation Tramways and Motors.**—The annual report of the general manager and engineer, Mr. William Forbes, for the year ending March 31 last, shows a profit of £12,526, after paying all charges, including interest and sinking fund, which compares with £7,709 in 1929, and £4,900 in the year ended March, 1928.

**Stalybridge Tramways Board.**—After a history of 30 years the Stalybridge, Hyde, Mossley and Dukinfield Tramways and Electricity Board has made its first grant of £1,000 in relief of rates to each of the four constituent authorities. Councillor A. Sawley, chairman of the Finance Committee, said that each town had contributed approximately £36,000 to the working of the undertaking.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended July 30 amounted to £80,300, a decrease of £707 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to July 30 (17 2-7 weeks), the total receipts were £1,438,578, a decrease of £6,902.

**East Ham Tramways** for the third year in succession show a gross profit on working, the amount being £23,277, an increase of £1,035 over the previous year. The working expenses increased by £3,635. The net result for the year, after allowing increased amounts for interest and redemption of capital and crediting a decreased amount in respect of unemployment grant, is a deficiency of £8,206.

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## MISCELLANEOUS NEWS AND NOTES.

**Trolleybuses for Hull.**—Hull Corporation Parliamentary Committee has adopted the recommendation to seek powers to run trolleybuses.

**Proposed Underground Garage at Hull.**—Hull Dock Committee has considered a scheme submitted by the City Engineer for constructing an underground garage at a cost of £80,000.

**Salford Fares.**—A sub-committee of the Salford Tramways Committee is to be appointed to consider adjustments in omnibus and tramcar fares and stages, owing to the heavy loss on the tramways last year.

**Manchester Driver Fatally Injured.**—A Manchester tramcar driver was fatally injured on July 24. He was leaning over his platform at the side of the car and was struck by a car passing in the opposite direction.

**Newcastle-Blackpool Service.**—Penrith Licensing Committee has approved the proposal of Ribble Motor Services, Ltd., for a joint service with the United Automobile Services, Ltd., for Newcastle-Carlisle-Penrith-Blackpool.

**Omnibuses for Derby.**—A special committee of Derby Town Council, which has been considering the local traffic problem, recommends the Council not to renew the existing tramway system, but to replace it with trolleybuses or petrol omnibuses.

**Garage Extension at Leeds.**—The Lord Mayor of Leeds on July 21 opened an extension to the municipal omnibus garage. The interior of the whole garage has been rearranged and brought up to date, the total expenditure amounting to £46,580, which has been met out of revenue.

**Motor Patrols.**—In the House of Commons on July 28, Mr. Clynes, in reply to a question, said that motor patrols in plain clothing are not at present on duty in the London area, to report in cases of careless, inefficient or dangerous driving, but the question of employing them is under consideration.

**Brighton Fares Reduced.**—On October 1 the existing 1½d. and 2d. fares on the Brighton tramways will be reduced to 2d. and 3d. return, except in those cases where such a change would make half the return fare less than the pre-war single fares. All "through" tickets to or from the railway station are to be 2d.

**Lanarkshire Traction Co.**—In consideration of the payment of £12,500, the Lanarkshire County Council have relieved the Lanarkshire Tramways Co. of their legal responsibility for the re-instatement of the tramways. On their abandoning the system the whole of the tramway equipment, track, setts and underground cables are to be handed over to the County Council.

**"City Circle" at Birmingham.**—Birmingham Tramways and Omnibus Committee desire to inaugurate a service on a route to be defined as the "city circle," which comprises a number of streets. After examination of the streets the Committee reported that a number are unsuited for an omnibus service, and the Public Works Committee has decided to advise the Council to carry out the work of road reconstruction at an estimated cost of £35,326.

**L.G.O.C. Express Services.**—Green Line Coaches, recently formed as an auxiliary of the London General Omnibus Co., Ltd., is taking over its express services. Already 100 coaches are running on express routes to points within a radius of 20 miles from Charing Cross. The through coaches are painted green to distinguish them from the ordinary service vehicles. Among the places served are Windsor, Sunbury, Guildford, Watford, Reigate, Dorking and Tunbridge Wells.

**London Street Accidents.**—Sir Henry Jackson, a member of the London Traffic Advisory Committee, says that more people are killed in London traffic on Fridays than on any other day of the week. The number of people under 15 years of age who are being killed in London streets was steadily decreasing. This was due to the intensive education given at schools on how to avoid street accidents. The number killed between the ages of 15 and 60 years was, however, steadily increasing. Last year over 70 per cent. of people killed were pedestrians, 13 per cent. were pedal cyclists, and 7 per cent. were motor cyclists.

**New Spanish Electrical Company.**—The Westinghouse Electric International Co. has joined with a group of Spanish financial and industrial leaders in the formation of a new company to be known as Constructora Nacional Maquinaria Electrica, which will manufacture generators, motors, transformers, and other electrical apparatus in Spain. The capital of the company will be twelve million pesetas, 75 per cent. of which has been subscribed by a Spanish group. The remaining 25 per cent. has been taken by French and American associated companies. The new company will collaborate with both the Westinghouse Electric International Company and Le Materiel Electrique S-W, a French company recently formed by Schneider-Creusot and Westinghouse interests.

**Long-Distance Coaches in London.**—In view of the increasing number of long-distance motor coaches entering and leaving London daily, interest attaches to the following statement made to the House of Commons on July 29 by Mr. Herbert Morrison, Minister of Transport, in reply to a question by Captain Sir Wm. Brass: "There is no information available as to the number of motor coaches which enter the centre of London daily. As regards size, motor coaches are subject to the statutory restrictions applicable to all heavy motor cars, but there is no direct control of these vehicles when in the Metropolitan Police District as regards either their number or the streets which they may traverse. They will, however, be controlled in these respects when the provisions of the Road Traffic Bill now before Parliament relating to public service vehicles in the Metropolitan Area come into force."

**Transfer Tickets.**—Mr. L. E. Harvey, general manager and engineer of Ilford Corporation Tramways, in a report to the Tramways Committee on transfer tickets, states that there is a consensus of opinion among tramway operators against their use. The difficulty of checking them and the abuses to which they are subjected by passengers are two points against them. Except in a few occasional instances, Mr. Harvey does not consider that transfers are wanted, and as far as Ilford is concerned, they would be, he says, in effect a form of concession that the undertaking cannot afford at the present time.

**Trolleybuses for Lancashire Tramways.**—The South Lancashire Tramways Company on July 30 substituted double-deck trolleybuses for tramcars on seven miles of their route from Atherton to Ashton by way of Hindley. Later the 'buses will be used throughout their routes. The South Lancashire Tramways form part of the undertaking of the Lancashire United Transport and Power Company. Their tramcars operate over 37 miles of the industrial area that extends from Manchester through Salford to Bolton, thence to Atherton, Hindley, Ashton-in-Makerfield and Lowton St. Mary's. The company considers that the trolleybus provides the best solution of the problem of town and suburban traffic.

**Manchester Long-Distance Services.**—Representatives of Manchester Corporation and neighbouring local authorities met on July 25 to discuss the co-ordination of omnibus services. A sub-committee was appointed to negotiate further with the railway companies running services in the area. It is understood that the routes discussed were those covering long distances and running through Manchester. It is hoped that an arrangement may be made with the railway companies on similar lines to the agreement between Manchester and the North Western Road Car Co. so as to clear up the question of setting down and picking up within the city. In most cases long-distance omnibuses are not allowed to do this.

**Important Licensing Judgment.**—A case of considerable importance both to licensing authorities and omnibus operators came before the Luton Borough magistrates, in which the Union Jack (Luton) Omnibus Co., Ltd., was summoned on June 28 on three counts for plying for hire with a motor omnibus without a licence. The proceedings were taken by the Chief Constable of Luton, and in stating the case the Town Clerk said that the Town Council refused to grant a licence, but notwithstanding this refusal the company continued to ply for hire. The legal representative of the company intimated that he did not dispute the facts as stated, but submitted that there was no case to answer as the proceedings were misconceived. They were taken under the Town Police Clauses Act of 1847, and that Act did not give any power to the Chief Constable to take proceedings for penalties which could only be taken by an aggrieved party or a person specially instructed by the local authority or the Attorney-General. After considerable argument, in which the Town Clerk submitted that the local authority was acting through the Chief Constable as their officer, the Chairman of the magistrates said it was a most interesting legal point, and they had decided to adjourn the case for a month in order to prepare a considered judgment. In giving this on July 28, the Chairman stated that while they found the charges proved, to enable an officer of the Corporation to recover penalties, authority must be given by special resolution by the Corporation before the institution of proceedings. No evidence of any such authority had been given, therefore they had no alternative but to dismiss the case

## CONTRACTS.

**Coventry Tramways Committee** proposes to extend the omnibus depot at Priestleys Bridge at a cost of £14,000.

**Dover Transport Committee** intends to apply for sanction to borrow £9,864 for the purchase of six omnibuses.

**Manchester Corporation** has placed an order with the Cargo Fleet Iron Co., Middlesbrough, for 2,000 tons of tramway rails.

**Leicester Tramways Committee** has accepted the tender of Dorman, Long & Co., Ltd., at £2,131 5s. for the supply of tramway rails.

**Birmingham Tramways Committee** has authorised the purchase of sixteen Austin "Sevens" for the use of departmental officials.

**Plymouth Transport Committee** has accepted the tender of Leyland Motors, Ltd., for the supply of six double-deck motor omnibuses at £1,688 10s. each.

**Leeds Tramways Committee** has agreed to purchase from Crossley Motors, Ltd., a double-deck omnibus at present in service for demonstration purposes

**Liverpool Tramways and Electricity Committee** has accepted the tender of the General Vehicle Co. for an electrically driven tower wagon at £956, and of Edgar Allen & Co., Ltd., for tramway special trackwork at £1,130.

**The London County Council** is to purchase fourteen motor vehicles for the Tramways Department at an estimated cost of £9,790. The L.C.C. Establishment Committee proposes to provide six cars for the use of officials at a cost of £2,125.

**John I. Thornycroft & Co., Ltd.,** have a contract with the War Office for a further 40 of their latest type of six-cylinder, rigid, six-wheel motor vehicles. These will supplement the large fleet of similar vehicles already in service with the Army mechanical transport.

**The British Aluminium Co., Ltd.,** has received an order from the Sociedad Financiera de Industrias y Transportes Barcelona, acting for the Levante Light & Power Company of Spain, for aluminium steel-cored electric cable, and Mr. R. B. Holt has been retained to inspect and test.

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**Wandsworth Highways Committee** has recommended the acceptance of the tender of Karrier Motors, Ltd., at £984 18s., for the supply of a motor sweeping machine with sprinkler and collector.

**Dyer & Young, Ltd.,** of Stanstead, Essex, have recently received orders from the following authorities: Glasgow Corporation Transport, 500 armature coils; Manchester Corporation Tramways, controller fingers; Bradford Corporation, controller fingers; London County Council, armatures; Atlas Electric & General Trust, Ltd., armature coils and controller spares.

**Douglas (I.O.M.) Corporation** have recently purchased seven Tilling-Stevens petrol electric omnibuses. These machines are of 30-40 h.p., and carry 34 passengers. The vehicles are fitted with semi-bucket back seats, well upholstered in red hide, and have Strachans' patent drop windows, which are under the control of either passenger or conductor. On the back platform are tip-up seats and there is room for some luggage. Four-wheel brakes of the servo-type are fitted. Douglas Corporation now have 40 omnibuses, some of which have been in service for many years, and will require to be replaced shortly.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name. | Week ended | Latest Return. 1929 | Latest Return. 1930 | Latest Return. + or — | Aggregate. Wks | Aggregate. 1930 | Aggregate. + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. | July 29 | 557 | 559 | + 2 | 17 | 9,722 | — 231 |
| „ Motor Buses | „ 29 | 207 | 297 | + 90 | 17 | 4,947 | + 779 |
| „ Total | „ 29 | 764 | 856 | + 92 | 17 | 14,669 | + 548 |
| Aberdeen Corp. | „ 23 | 7,508 | 6,128 | — 1,380 | 7½ | 41,869 | — 1,963 |
| Ashton-u-Lyne Corp. | „ 26 | 906 | 845 | — 61 | 17 | 14,521 | — 1,113 |
| „ Motor Buses | „ 26 | 507 | 496 | — 11 | 17 | 8,524 | + 7 |
| „ Trolley Buses | „ 26 | 277 | 247 | — 37 | 17 | 4,458 | — 347 |
| „ Total | „ 26 | 1,690 | 1,588 | — 102 | 17 | 27,503 | — 1,453 |
| Ayr Corporation | „ 26 | 945 | 1,426 | + 481 | 10 | 6,897 | — 812 |
| Barrow Corporation | „ 19 | 767 | 602 | — 165 | 16 | 9,320 | — 674 |
| „ Motor Buses | „ 19 | 534 | 456 | — 78 | 16 | 6,423 | + 978 |
| „ Total | „ 19 | 1,301 | 1,058 | — 243 | 16 | 15,743 | + 304 |
| Belfast City | „ 25 | 10,154 | 10,284 | + 130 | 16½ | 190,878 | + 6,888 |
| „ Motor Buses | „ 25 | 883 | 1,120 | + 237 | 16½ | 22,079 | + 4,678 |
| „ Total | „ 25 | 11,037 | 11,404 | + 367 | 16½ | 212,957 | + 11,566 |
| Birkenhead Corp. | „ 27 | 1,646 | 1,566 | — 80 | 17 | 26,867 | — 1,913 |
| „ Motor Buses | „ 27 | 3,782 | 3,809 | + 27 | 17 | 60,901 | + 3,493 |
| „ Total | „ 27 | 5,428 | 5,375 | — 53 | 17 | 87,768 | + 1,580 |
| Birmingham Corp. | „ 22 | 27,998 | 24,983 | — 3,015 | 16 | 430,740 | — 8,283 |
| „ Motor Buses | „ 22 | 13,741 | 14,390 | + 649 | 16 | 248,201 | + 42,597 |
| „ Trolley Buses | „ 22 | 558 | 539 | — 19 | 16 | 18,972 | + 107 |
| „ Total | „ 22 | 42,297 | 39,912 | — 2,385 | 16 | 687,913 | + 34,421 |
| Blackburn Corp. | „ 23 | 1,844 | 1,625 | — 219 | 16½ | 32,458 | — 2,126 |
| „ Motor Buses | „ 23 | Nil | 342 | + 342 | 16½ | 5,274 | + 5,274 |
| „ Total | „ 23 | 1,844 | 1,967 | + 123 | 16½ | 37,732 | + 3,148 |
| Bradford Corporation | „ 26 | 14,973 | 14,201 | — 772 | 17 | 242,670 | — 10,736 |
| Brighton Corporation | „ 27 | 2,936 | 2,949 | + 13 | 16½ | 45,465 | + 2,080 |
| Burnley Corporation | „ 26 | 2,960 | 2,747 | — 213 | — | ... | — |
| „ Motor Buses | „ 26 | 640 | 666 | + 26 | — | — | — |
| „ Total | „ 26 | 3,600 | 3,413 | — 187 | — | ... | — |
| Burton-on-Trent Corp. | „ 27 | 1,103 | 865 | — 238 | 17 | 14,375 | + 573 |
| Bury Corporation | „ 27 | 1,938 | 1,795 | — 143 | 16½ | 21,114 | — 4,201 |
| „ Motor Buses | „ 27 | 488 | 1,153 | + 665 | 16½ | 18,552 | + 11,699 |
| „ Total | „ 27 | 2,426 | 2,948 | + 522 | 16½ | 49,666 | + 7,498 |
| Cardiff Corporation | „ 26 | 7,736 | 7,457 | — 279 | 16½ | 130,996 | + 2,589 |
| Chatham and District | „ 17 | 1,393 | 1,226 | — 167 | 28 | 31,693 | + 1,248 |
| Chester Corporation | „ 27 | 429 | Nil | — 429 | 17 | Nil | — 7,612 |
| „ Motor Buses | „ 27 | Nil | 694 | + 694 | 17 | 11,173 | + 11,173 |
| „ Total | „ 27 | 429 | 694 | + 265 | 17 | 11,173 | + 3,561 |
| Chesterfield Corp. | „ 28 | 1,847 | 1,970 | + 123 | 17 | 31,779 | + 1,216 |
| Colchester Corp. | „ 23 | 566 | 649 | + 83 | 17 | 10,082 | + 1,145 |
| Colne Corporation | „ 30 | 685 | 723 | + 38 | 17 | 12,310 | — 74 |
| Coventry Corporation | „ 27 | 2,053 | 2,001 | — 52 | 17 | 34,289 | — 2,284 |
| „ Motor Buses | „ 27 | 1,531 | 1,835 | + 304 | 17 | 30,791 | + 4,067 |
| „ Total | „ 27 | 3,584 | 3,836 | + 252 | 17 | 65,080 | + 1,783 |
| Darlington Corp. | „ 19 | 992 | 1,089 | + 97 | 15½ | 16,878 | + 1,593 |
| Derby Corporation | „ 26 | 2,557 | 2,430 | — 127 | 17 | 41,409 | — 744 |
| „ Motor Buses | „ 26 | 770 | 960 | + 190 | 17 | 15,496 | + 3,845 |
| „ Total | „ 26 | 3,327 | 3,390 | + 63 | 17 | 56,965 | + 3,101 |
| Dover Corporation | „ 26 | 479 | 469 | — 10 | 17 | 6,898 | + 226 |
| Dundee Corporation | „ 15 | 2,784 | 2,482 | — 302 | 8½ | 22,748 | — 848 |
| „ Motor Buses | „ 15 | 866 | 1,138 | + 272 | 8½ | 9,100 | + 1,729 |
| „ Total | „ 15 | 3,650 | 3,620 | — 30 | 8½ | 31,848 | + 881 |
| East Ham Corp. | „ 26 | 2,248 | 2,246 | — 2 | 15½ | 38,687 | + 761 |
| Edinburgh Corp. | „ 19 | 17,312 | 14,278 | — 3,034 | 9½ | 146,755 | — 45 |
| „ Motor Buses | „ 19 | 3,860 | 3,370 | — 490 | 9½ | 37,347 | + 2,646 |
| „ Total | „ 19 | 21,172 | 17,648 | — 3,524 | 9½ | 184,102 | + 2,601 |
| Exeter Corporation | „ 23 | 910 | 830 | — 80 | 16 | 13,726 | — 651 |
| „ Motor Buses | „ 23 | 167 | 287 | + 120 | 16 | 4,709 | + 2,625 |
| „ Total | „ 23 | 1,077 | 1,117 | + 40 | 16 | 18,435 | + 1,974 |
| Glasgow Corporation | June 28 | 46,055 | 45,219 | — 836 | 4 | 183,870 | + 3,175 |
| „ Motor Buses | „ 28 | 5,355 | 8,696 | + 3,341 | 4 | 34,758 | + 13,500 |
| „ Total | „ 28 | 51,410 | 53,915 | + 2,505 | 4 | 218,628 | + 16,675 |
| Gloucester Corp. | July 23 | 571 | 681 | + 110 | 16½ | 11,561 | + 2,571 |
| Grimsby Corporation | „ 26 | 1,519 | 1,642 | + 123 | 17 | 26,061 | + 3,241 |
| Halifax Corporation | „ 28 | 4,814 | 5,121 | + 308 | 16½ | 84,356 | + 9,790 |
| Huddersfield Corp. | „ 26 | 6,353 | 6,061 | — 292 | 17 | 108,278 | — 1,660 |
| Hull Corporation | „ 26 | 5,665 | 5,505 | — 160 | 17 | 96,950 | — 1,157 |
| „ Motor Buses | „ 26 | 1,347 | 1,658 | + 311 | 17 | 25,406 | + 3,234 |
| „ Total | „ 26 | 7,012 | 7,163 | + 151 | 17 | 122,356 | + 2,077 |
| Ilford Corporation | „ 26 | 1,455 | 1,437 | — 18 | 16½ | 25,738 | + 599 |
| Ipswich Corp. Trol.Bus | „ 26 | 1,285 | 1,372 | + 87 | 16½ | 22,446 | + 1,388 |
| Isle of Thanet | „ 23 | 1,882 | 1,506 | — 376 | 29½ | 18,697 | — 1,164 |
| Kilmarnock Corp. | „ 26 | 471 | 511 | + 40 | 10½ | 5,135 | + 213 |
| Lancashire Un. | „ 20 | 2,269 | 1,951 | — 318 | 28½ | 61,634 | — 3,010 |
| „ Motor Buses | „ 20 | 4,766 | 5,155 | + 389 | 28½ | 138,735 | + 20,033 |
| Leeds Corporation | „ 26 | 20,049 | 19,571 | — 478 | 16½ | 340,060 | + 9,091 |
| Leicester Corp. | „ 26 | 8,671 | 8,545 | — 126 | 17 | 142,168 | + 1,400 |
| Lincoln Corp. | „ 20 | 957 | 919 | — 38 | 16 | 14,840 | + 41 |
| Liverpool Corp. | „ 26 | 30,431 | 28,826 | — 1,605 | 16½ | 506,864 | + 2,258 |
| London County Coun. | „ 30 | 81,007 | 80,300 | — 707 | 17½ | 1,438,578 | — 6,902 |
| Luton Corporation | „ 23 | 441 | 410 | — 31 | 16½ | 7,141 | + 351 |
| Maidstone Corp. | „ 24 | 233 | Nil | — 233 | 16½ | Nil | — 4,085 |
| „ Motor Buses | „ 24 | 297 | 274 | — 23 | 16½ | 4,605 | + 7 |
| „ Trolley Buses | „ 24 | 308 | 578 | + 270 | 16½ | 10,267 | + 5,164 |
| „ Total | „ 24 | 838 | 852 | + 14 | 16½ | 14,872 | + 1,086 |
| Manchester Corp. | „ 26 | 35,251 | 32,055 | — 3,196 | 17 | 546,304 | — 48,190 |
| „ Motor Buses | „ 26 | 5,222 | 8,562 | + 3,340 | 17 | 145,659 | + 60,617 |
| „ Total | „ 26 | 40,473 | 40,617 | + 144 | 17 | 691,963 | + 12,427 |
| Middlesbrough Corp. | „ 22 | 1,169 | 1,023 | — 146 | 16½ | 17,169 | — 1,081 |
| „ Motor Buses | „ 22 | 519 | 575 | + 56 | 16½ | 9,243 | + 1,015 |
| „ Total | „ 22 | 1,688 | 1,598 | — 90 | 16½ | 26,412 | — 66 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | Latest Return. 1930 | Latest Return. + or — | Aggregate. Wks. | Aggregate. 1930 | Aggregate. + or — |
|---|---|---|---|---|---|---|---|
| | | | | £ | | £ | £ |
| Newcastle-on-Ty.Corp. | July 26 | 10,087 | 8,447 | — 1,640 | 16½ | 148,113 | — 20,279 |
| „ Motor Buses | „ 26 | 2,183 | 3,096 | + 913 | 16½ | 50,595 | + 16,045 |
| „ Total | „ 26 | 12,270 | 11,543 | — 727 | 16½ | 198,708 | — 4,234 |
| Newport Corporation | „ 19 | 1,689 | 1,597 | — 92 | 16 | 25,479 | — 898 |
| „ Motor Buses | „ 19 | 775 | 780 | + 5 | 16 | 12,890 | — 1,031 |
| „ Total | „ 19 | 2,464 | 2,377 | — 87 | 16 | 38,369 | + 133 |
| Northampton Corp. | „ 25 | 1,069 | 1,060 | — 9 | 16½ | 18,241 | — 390 |
| „ Motor Buses | „ 25 | 676 | 681 | + 5 | 16½ | 12,060 | + 1,325 |
| „ Total | „ 25 | 1,745 | 1,741 | — 4 | 16½ | 30,301 | + 935 |
| Nottingham Corp | „ 24 | 6,774 | 5,664 | — 1,110 | 16½ | 95,998 | — 13,533 |
| „ Motor Buses | „ 24 | 2,259 | 3,278 | + 1,019 | 16½ | 54,677 | + 17,489 |
| „ Trolley Buses | „ 24 | 594 | 1,200 | + 606 | 16½ | 19,900 | + 10,083 |
| „ Total | „ 24 | 9,627 | 10,142 | + 515 | 16½ | 170,575 | + 14,039 |
| Oldham Corporation | „ 26 | 3,594 | 3,264 | — 330 | 18 | 60,098 | — 4,719 |
| „ Motor Buses | „ 26 | 2,239 | 1,886 | — 353 | 18 | 35,990 | — 1,001 |
| „ Total | „ 26 | 5,833 | 5,150 | — 683 | 18 | 96,088 | — 5,720 |
| Plymouth Corp. | „ 26 | 4,109 | 3,820 | — 289 | 16½ | 61,267 | — 2,107 |
| „ Motor Buses | „ 26 | 2,036 | 2,556 | + 520 | 16½ | 40,363 | + 8,433 |
| „ Total | „ 26 | 6,145 | 6,376 | + 231 | 16½ | 101,630 | + 6,326 |
| Portsmouth Corp. | „ 26 | 5,341 | 4,489 | — 852 | 17 | 68,003 | — 5,875 |
| „ Motor Buses | „ 26 | 2,355 | 3,477 | + 1,122 | 17 | 55,357 | + 22,300 |
| „ Total | „ 26 | 7,696 | 7,966 | + 270 | 17 | 123,360 | + 16,425 |
| Preston Corporation | „ 23 | 1,793 | 1,731 | — 62 | 16½ | 27,322 | — 1,304 |
| „ Motor Buses | „ 23 | 500 | 556 | + 56 | 16½ | 8,481 | + 595 |
| „ Total | „ 23 | 2,293 | 2,287 | — 6 | 16½ | 35,803 | — 709 |
| Rawtenstall Corp. | „ 27 | 768 | 603 | — 165 | 16½ | 11,323 | — 3,251 |
| „ Motor Buses | „ 27 | 487 | 666 | + 179 | 16½ | 11,855 | + 2,780 |
| „ Total | „ 27 | 1,255 | 1,269 | + 14 | 16½ | 23,178 | — 471 |
| Reading Corporation | „ 24 | 1,508 | 1,345 | — 163 | 16 | 23,786 | — 981 |
| „ Motor Buses | „ 24 | 991 | 927 | — 64 | 16 | 16,801 | + 1,779 |
| „ Total | „ 24 | 2,499 | 2,272 | — 227 | 16 | 40,587 | + 798 |
| Rochdale Corp. | „ 26 | 3,097 | 2,048 | — 1,049 | ... | 46,345 | — 4,966 |
| „ Motor Buses | „ 26 | 1,645 | 1,384 | — 261 | ... | 26,497 | + 360 |
| „ Total | „ 26 | 4,742 | 3,432 | — 1,310 | ... | 72,842 | — 4,606 |
| Rotherham Corp. | „ 28 | 2,640 | 2,766 | + 126 | 17 | 46,956 | + 2,153 |
| Salford Corporation | „ 27 | 10,910 | 11,045 | + 135 | 16½ | 191,669 | + 2,536 |
| Sheffield Corp. | „ 26 | 20,936 | 19,231 | — 1,705 | 16½ | 350,105 | — 5,019 |
| Southampton Corp. | „ 23 | 3,499 | 3,423 | — 75 | 17 | 56,549 | + 1,079 |
| „ Motor Buses | „ 23 | 817 | 830 | + 12 | 17 | 14,437 | + 2,227 |
| „ Total | „ 23 | 4,316 | 4,253 | — 63 | 17 | 70,986 | + 3,306 |
| Southend-on-Sea Corp. | „ 30 | 2,732 | 2,433 | — 299 | 17½ | 37,324 | — 1,708 |
| „ Trolley Buses | „ 30 | 191 | 366 | + 175 | 17½ | 5,233 | + 2,496 |
| „ Total | „ 30 | 2,923 | 2,799 | — 124 | 17½ | 42,557 | + 788 |
| Southport Corp. | „ 19 | 1,514 | 1,447 | — 67 | 15½ | 21,093 | — 76 |
| „ Motor Buses | „ 19 | 460 | 458 | — 2 | 15½ | 6,709 | + 737 |
| „ Total | „ 19 | 1,974 | 1,905 | — 69 | 15½ | 27,802 | + 661 |
| St. Helens Corp. | „ 22 | 2,012 | 2,066 | + 54 | 16 | 32,968 | + 2,170 |
| Sunderland Corp. | „ 29 | 2,578 | 2,615 | + 37 | 17 | 43,046 | + 1,440 |
| „ Motor Buses | „ 29 | 341 | 594 | + 253 | 17 | 8,925 | + 5,927 |
| „ Total | „ 29 | 2,919 | 3,209 | — 290 | 17 | 51,971 | + 7,367 |
| Swindon Corp. | „ 23 | 856 | 802 | — 54 | 16½ | 15,938 | + 3,917 |
| Wallasey Corp. | „ 26 | 1,537 | 1,235 | — 302 | 16½ | 21,188 | — 1,824 |
| „ Motor Buses | „ 26 | 2,594 | 2,452 | — 142 | 16½ | 39,067 | + 3,990 |
| „ Total | „ 26 | 4,131 | 3,687 | — 444 | 16½ | 60,855 | + 2,166 |
| Walsall Corporation | „ 26 | 3,271 | 3,154 | — 117 | 16 | 55,397 | + 1,525 |
| Walthamstow Corp. | „ 26 | 2,505 | 2,391 | — 114 | 16½ | 41,977 | + 94 |
| Warrington Corp. | „ 24 | 860 | 881 | + 21 | 17 | 15,033 | + 41 |
| „ Motor Buses | „ 24 | 430 | 511 | + 81 | 17 | 8,533 | + 1,040 |
| „ Total | „ 24 | 1,290 | 1,392 | + 102 | 17 | 23,566 | + 1,081 |
| West Ham Corp. | „ 24 | 5,830 | 5,816 | — 14 | 16½ | 101,038 | + 2,534 |
| Wolverhampton Corp | | | | | | | |
| „ Motor Buses | „ 20 | 2,833 | 2,326 | — 507 | 16 | 38,953 | — 5,074 |
| „ Trolley Buses | „ 20 | 3,526 | 3,407 | — 119 | 16 | 56,576 | + 3,474 |
| „ Total | „ 20 | 6,359 | 5,733 | — 626 | 16 | 95,529 | — 2,500 |
| York Corporation | „ 23 | 1,443 | 1,039 | — 404 | 17 | 17,258 | — 49 |
| „ Motor Buses | „ 23 | 470 | 551 | + 81 | 17 | 8,368 | + 2,219 |
| „ Trolley Buses | „ 23 | 68 | Nil | — 61 | 17 | Nil | — 860 |
| „ Total | „ 23 | 1,981 | 1,590 | — 391 | 17 | 25,262 | + 1,310 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | Latest Return. 1930 | Aggregate. Wks. or *M* | Aggregate. 1930 | Aggregate. In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | July 29 | £80,238 | £76,670 | 30 *w* | £2,498,141 | — £100,239 |
| Brazilian Traction $ | June | 4,210,893 | 4,146,884 | 6 *m* | 24,286,359 | + 249,334 |
| British Columbia $. | June | 1,133,017 | 1,144,585 | 12 *m* | 14,658,732 | + 610,860 |
| Buenos Aires Lacroze | July 27 | 11,148 | 10,825 | 4 *w* | 40,450 | — 5,045 |
| Burma E. Sup. Co. Rs. | June | 63,157 | 66,317 | 11 *m* | 709,845 | — 18,866 |
| Calcutta ... Rs. | July 26 | 122,907 | 103,270 | 29½ *w* | 3,333,662 | — 447,099 |
| Cape Town ... ... | June | 27,995 | 25,525 | ... | ... | — |
| Carthagena & Herrerias | June | 1,476 | 515 | 6 *m* | 5,612 | — 209 |
| Durban ... ... | May | 24,518 | 23,945 | 10 *m* | 238,483 | — 714 |
| East India ... ... | June | 3,772 | 3,803 | 11 *m* | 41,627 | + 438 |
| Kalgoorlie ... ... | Apr. | 1,673 | 1,718 | 4 *m* | 6,319 | Nil |
| Madras (2 weeks) Rs. | July 15 | 50,308 | 52,435 | 26 *w* | 600,966 | + 30,600 |
| Para ... ... | June | 15,450 | 15,028 | 7 *m* | 103,807 | + 749 |
| Port Elizabeth ... | June | 7,335 | 6,951 | ... | ... | ... |
| Rangoon ... Rs. | June | 114,535 | 142,170 | 6 *m* | 899,635 | + 190,824 |
| Shanghai ... $ | June | 335,740 | 367,231 | 6 *m* | 1,923,202 | — 42,708 |
| Singapore ... ...$ | June | 123,000 | 140,000 | 9 *m* | 1,223,000 | + 140,000 |
| Winnipeg ... ...$ | June | 517,738 | 479,958 | 6 *m* | 3,273,504 | — 66,574 |

## RAILWAY RECEIPTS.

| 30th Week ended July 27th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 308,000 | — 35,000 | 314,000 | — 34,000 | 622,000 | — 69,000 | — 740,000 |
| L.M.S.R. | 699,000 | — 62,000 | 696,000 | — 84,000 | 1,395,000 | — 146,000 | —2,157,000 |
| L.N.E.R. | 459,000 | — 48,000 | 560,000 | — 102,000 | 1,019,000 | — 150,000 | —1,210,000 |
| S.R. | 417,000 | — 26,000 | 109,000 | — 3,000 | 526,000 | — 29,000 | — 193,000 |
| Totals | 1,883,000 | — 171,000 | 1,679,000 | — 223,000 | 3,562,000 | — 394,000 | —4,330,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | Latest Return. 1930. | Latest Return. + or — | Aggregate. 1930. | Aggregate. + or — |
|---|---|---|---|---|---|---|
| LONDON UNDERGROUND | | | | | | |
| Common Fund Cos. | July 26 | 297,900 | 294,300 | — 3,600 | 9,058,400 | + 569,700 |
| Lond. & Sub. Group | „ 26 | 44,700 | 43,500 | — 1,200 | 1,322,600 | + 96,700 |
| METROPOLITAN RAILWAY | „ 26 | 36,700 | 36,500 | — 200 | 1,322,600 | + 24,700 |
| LIVERPOOL OVERHEAD | „ 27 | 1,859 | 1,771 | — 88 | 46,272 | — 2,759 |
| MERSEY RAILWAY ... | „ 26 | 4,047 | 4,146 | + 99 | 137,252 | + 4,383 |

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LONDON, AUGUST 9, 1930.

## SIR HENRY MAYBURY'S LIVERPOOL REPORT.

In view of the great changes that will be effected in traffic when the new tunnel between Liverpool and Birkenhead is opened, Liverpool Corporation asked Sir Henry Maybury to advise them on the steps that should be taken to meet the new position. As the future of public passenger transport is allied to the same question, it was natural that the city's requirements in that respect should form part of the consultant's report. A suggestion for an underground railway in the central area is rejected as not being a feasible or economic proposition, and Sir Henry can see no advantage accruing from connecting the Overhead Railway along the docks with the tramway system, especially as such a development would mean practically the reconstruction of the whole of the railway. The author of the report, which has been in preparation since May of last year, is just as emphatic in predicting continued success for the 167 miles of tramways, provided attention continues to be paid to two matters. These are the provision of larger cars and securing an increase in speed. For some time these matters have been engaging the attention of the department, as recorded on several occasions in this journal; but Sir Henry urges that the improvement of the cars generally has not kept pace with the demand for increased comfort in travel. As a justification for improved cars and higher speed, he points to the case of the London County Council's tramways, which have won success despite increased omnibus competition. Sir Henry declares that with their well-kept-up tracks the Liverpool tramways are an excellent investment for the city, one capable of serving the public extremely well for many years, and of earning large profits. With this expression of opinion is linked a proviso that there should be no delay in obtaining comfortably appointed bogie cars capable of accommodating 85 passengers at rush hours. In view of the great improvement in trolley and petrol omnibuses, the report does not advocate any general extension of the tramways. For the expansion of the transport facilities additions to the ordinary omnibus fleet are suggested. Regarding the long-distance omnibuses from other towns, the report makes a timely suggestion that it is reasonable now to require the proprietors, like other traders, to provide stations on private property instead of occupying the highways. In dealing with the conditions likely to arise from the opening of the Mersey Tunnel, the report advises that the Old Haymarket should be constituted the main traffic exchange centre. This will involve one-way working in several streets, and will affect the tramways in some instances.

## OMNIBUSES TO REPLACE TRAMWAYS.

WIGAN AND EXETER DECISIONS.

The Wigan Corporation has decided to abandon the whole of the tramway system and to substitute petrol omnibuses. The substitution will take place by stages, but as quickly as possible. Application will be made to the Ministry of Transport to borrow £62,700 for the purchase of 38 omnibuses. The tramway system serves numerous outlying districts, and totals 27 miles. The loan debt amounts to £167,000, the bulk of which expires in about six years. For a long time discussions have taken place between the Corporation and neighbouring townships, and members of the Council have been divided as to whether petrol omnibuses or trolleybuses should be substituted. As it would take some eighteen months to get the necessary powers to operate trolleybuses, it was decided to introduce petrol omnibuses.

Exeter City Council on July 29 decided to adopt the Tramways Committee's recommendation to substitute petrol omnibuses for the present tramway system. It was stated that it would cost about £40,000 to put the tramway system in order, and that the cost of the omnibuses would be about £50,000. The substitution will be carried out by sections, and double-deck omnibuses will be used.

## TORQUAY AND THE REJECTED BILL.

The Torquay Town Council discussed on July 28 remarks alleged to have been made by Councillor E. Darke Bennett reflecting on the impartiality of the Mayor, Mr. E. H. Sermon, towards the Torquay and Paignton Traction Bill which was recently rejected by the House of Commons. Mr. Bennett was alleged to have stated that the Mayor's influence was more on the side of the Tramway Company than on that of the ratepayers. The Council unanimously passed a resolution expressing complete confidence in the Mayor and stating that his conduct had always been impartial and indeed beyond reproach. Commenting on the rejection of the Bill, the Mayor said that Mr. McKinlay, who moved the rejection in Parliament, was wrong in asserting that there was no provision for workmen's fares. The company would have been compelled, as before, to run trolleybuses for workmen morning and evening at ½d. per mile. Nor would the company have received higher fares. The present authorised fare was 1d. per mile, with a minimum fare of 2d., but under the Bill the authorised fare would have been 1d. per mile with a minimum fare of 1½d. Mr. Bennett moved that the Council should not give their support to any Bill promoted by the Tramways Company without first referring it to the ratepayers, but he was the only one to vote for it. A request from the Citizens' League to consider the acquisition of the tramways system was allowed to lie on the table, members of the Council stating that the idea of purchasing the tramways was preposterous.

## TROLLEYBUSES FOR DERBY.

The Derby Town Council, at a meeting on July 31, approved the recommendation of the Tramways Committee to substitute trolleybuses for the tramways, and to develop omnibus services for cross town traffic. Alderman Salisbury emphasised the heavy cost with which they were saddled in maintaining the track, which was nearing the end of its life, while of the present 78 cars, 28 should be "scrapped," and 20 others needed large expenditure for renovation. The Committee recognised that the call of the public to-day was for speed, and they pointed to the advantage of the trolleybus, stating that four trolleybuses were equal to five tramcars. Fourteen thousand pounds was paid to the Electricity Committee for current, and there was a tendency for electricity prices to go down. Six-wheel vehicles were recommended as most suitable for Derby.

**Bolton and Non-Union Employees.**—Bolton Corporation tramway and omnibus employees have threatened to strike in view of the employment of non-trade unionists in the tramway department. As members of the Transport and General Workers' Union they state that the time has arrived when the branch should be 100 per cent. organised, and they therefore notified the men not in compliance by 4.30 on Friday, August 22, that they would refuse to work with them. Mr. W. L. Crompton, the local secretary, estimates the proportion of non-unionists in the tramways department as less than 5 per cent. The Tramways Committee recently curtailed the service on account of decreased receipts as a result of trade depression, and had given notice of their intention to dispense with the guaranteed 48-hour week. On this question the employees have requested an immediate conference between the officials of the union and the tramways management.

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## LIVERPOOL'S TRAFFIC PROBLEMS.

SIR H. MAYBURY SUPPORTS THE TRAMWAYS.

Liverpool City Council in May, 1929, asked Sir Henry Maybury to investigate and report on city traffic problems, with special reference to the new Mersey Tunnel, and on the advantages and disadvantages of tramways and motor omnibuses. Sir Henry's report with his recommendations was issued this week.

As regards the tramway system Sir Henry predicts for it "a good transport and economic future, provided up-to-date, speedy, and comfortable rolling-stock is provided." He states that he is satisfied that it would not be a feasible and economic proposition to construct an underground tube system. "At no time of the day," he reports, "would there be a sufficient number of people desirous of travelling. The cost of laying and equipping an up-to-date underground system would be about £750,000 a mile, and no necessity or justification could be adduced for incurring any such expenditure." He considers that no useful passenger traffic advantage could result from the physical communication with the over-head railway, which consists of six miles of double track, and the tramway system. Sir Henry makes important proposals for securing direct access to the docks and the centre of the city from the East Lancashire-road by means of the Everton Tunnel-road, but also recommends certain street improvements.

Regarding the 167 miles of tramway track, he states that the work now being undertaken and foreshadowed, leads him to believe that the track is in excellent condition, and that it will have a long and useful life. The improvement of the cars generally has not kept pace with the maintenance of the track and with the demand for increased comfort and travel. A car capable of much higher speed without much discomfort appears to be desirable—*i.e.*, a larger and different type of vehicle constructed on the bogie principle. It should be designed to seat seventy to seventy-four passengers and have upholstered seats. With such a car, eighty-five people could quite well be accommodated during the rush hours. The Liverpool tramways have done so well over a long period of years, viewed from every standpoint, that Sir Henry cannot help thinking that they have a good economic future if more up-to-date rolling stock is obtained as soon as possible. "In London," he says, "the maintenance of higher standard of comfort and efficiency has enabled tramways to increase their traffic, even at the expense of the omnibuses," and he is quite sure that a similar result can be secured in Liverpool. The cost of operating a well organised and well managed tramway, amid a considerable potential travelling population, is probably lower per seat mile than is the case with any other passenger vehicle, save perhaps the trolleybus.

In its tramways, Sir Henry states, Liverpool has an excellent investment capable of serving the public extremely well for many years and of earning large sums of money for the ratepayers. The financial position for 1929 was very convincing of the soundness of the undertaking as a whole. Liverpool's tramway system is the fourth largest as regards mileage and passengers, and with the exception of Glasgow, the ordinary fares charged in Liverpool are the lowest. Sir Henry considers, however, that it would be unwise to contemplate any extension of the system, having regard particularly to the great improvement in trackless trolley vehicles and motor omnibuses. Sir Henry speaks highly of the trolleybuses, their cheap working, carrying capacity, comfort, flexibility, noiselessness, and the absence of offensive odour. Their average speed in the twenty-four towns where they are in operation is 8.75 miles per hour as compared with the Liverpool tramways' average of 8.5 miles. However, the time is not likely to arrive very soon when any substantial part of the Liverpool tramway system will be abandoned in favour of trolleybuses. Rather than provide overhead equipment for trolley vehicles, Sir Henry suggests that it will be the policy of the Corporation to augment its transport services by additions to the omnibus fleet.

## CONTRACTS.

**Warrington Corporation** has accepted the tender of Leyland Motors, Ltd., for three chassis with Titan engines.

**Dover Retains Tramways.**—Dover Tramways Committee has not applied for sanction for a loan for the purchase of omnibuses as erroneously reported in last week's issue.

**Sheffield Electricity Committee** has accepted the tender of Bruce, Peebles & Co., Ltd., at £9,238, for the supply of three 500 kw. rectifier equipments for tramway supply purposes.

**Glasgow Transport Committee** has recommended the acceptance of the following tenders for the supply each of 12 miles of copper trolley wire: Messrs. Felton Guilleaume, Germany, at £840; and I.C.C. Metals, Ltd., Birmingham, at £884 16s.

**The English Electric Company** have received an order from the borough of Walsall for two A.E.C. English Electric double-deck low-loading trolleybuses. Each vehicle will have a seating capacity for 60 passengers. The chassis will be built by the Associated Equipment Co., Ltd., and will be their model 663 T, which has a wheel-base of 16 ft. 6 ins., with rheostatic, air and hand-brakes. The body and the electrical equipment will be constructed by the English Electric Company, the equipment consisting of a DK.130 80-h.p. motor, mounted in a forward position on the chassis, and a standard English Electric contactor-type foot-operated controller.

**R.100 Spark Plugs.**—The Rolls Royce "Condor" engines of the airship R.100, which has recently accomplished the record Atlantic flight, were equipped with Lodge sparking plugs.

## MISCELLANEOUS NEWS AND NOTES.

**East Ham Council** has appointed a sub-committee to consider certain alleged grievances of the tramway employees.

**Ilford Council** has prohibited the carrying of wireless accumulators and batteries in their new tramcars because of the risk of damage by acid.

**Warrington Tramways Committee** has authorised the manager to substitute pneumatic tyres for solid tyres on motor omnibuses wherever possible.

**Guildford Watch Committee** has refused the application of the Premier Omnibus Co. and the Ledbury Transport Co. to operate omnibus services between London and Guildford.

**East Ham Corporation** has decided to grant to non-contributory old-age pensioners of 70 years and over free passes available between 10 a.m. and 4 p.m., except on Sundays, Saturdays and public holidays.

**Sunderland Tramways Committee** recently recommended that dogs should be allowed to travel on the tramcars. The Council, however, has rejected the recommendation, although it applied only to dogs in arms.

**Garage for Bridlington.**—The London and North-Eastern Railway proposes to take over from the Bridlington Council the land known as South Cliff Gardens, and to convert it into an omnibus parking ground and garage.

**A Garage Needed at Glasgow.**—The Transport Committee of Glasgow Corporation has requested the general manager and a committee of five to prepare a report on the requisitioning of a garage to accommodate 100 double-deck omnibuses.

**Road Construction.**—Copies of a circular letter and of a memorandum on the subject of the construction of roads has been issued by the Ministry of Transport to all highway authorities. The memorandum is No. 336 (Roads), H.M. Stationery Office, price 2d.

**Free Passes.**—Leicester City Council has consented to the proposal of the Tramways Committee that the seven members of the Public Assistance Committee, who are not members of the Council, should be granted free passes on the Corporation tramways and motors.

**Corporation Buys Omnibus Route.**—Newcastle Corporation Transport Department has taken over the service run by Fawdon Omnibus Co., and purchased the three omnibuses on the route. The company propose to develop their long-distance service to Coventry.

**Elephant and Castle Scheme.**—The House of Commons, before the Session ended, decided that the London County Council Bill for carrying out an extensive scheme for the improvement of traffic conditions at the Elephant and Castle, should be held over till the next session.

**Leamington Road Restoration.**—The Leamington Corporation has made an arrangement with the Leamington and Warwick Electrical Co., Ltd., whereby, it is understood, the company will remove the tramlines, etc., and the Corporation re-lay the road surface at 5s. 6d. per yard.

**London Tramcar Struck by Lightning.**—A tramcar, loaded with passengers, while going along London-road, Mitcham, during the storm on July 30, was struck by lightning, and took fire. The passengers escaped without injury and the flames were extinguished, but the car had to be towed home.

**Railway Economy.**—Dismissals of railway workers owing to the falling-off in traffic are reported from various parts of the country. Following previous announcements of reduction of staff, it is stated that 300 of the 1,800 men employed in the locomotive departments of the L. & N.E. Railway Co. at Doncaster are to be paid off this week.

**Bangor Omnibus Strike Settled.**—Twenty-five drivers and conductors of the "Tonic" 'Bus Services at Bangor, who ceased work on August 1, resumed their duties on August 7. The men demanded the reinstatement of a shop steward of the Transport and General Workers' Union who had been dismissed. As a result of negotiations the man was reinstated.

**New Lifts for Hampstead Station.**—Hampstead tube station, which is the deepest on the London Underground system, being 180 ft. below the street level, is to be provided with new and quicker lifts, which will make the ascent in less than 30 seconds. It is considered that lifts are more satisfactory than escalators for a station of such a depth.

**Chesterfield Transport Committee** has requested the Parliamentary Committee to incorporate in a Bill, if and when promoted, a clause suggested by the transport manager with regard to new routes, existing routes and full protection for the Department in connection with the picking up and setting down of passengers within the borough by competitive operators.

**Tenders for Copper Rail Bonds.**—The Stores Department of the City of Johannesburg is calling for tenders, to be presented in Johannesburg by August 28, for the supply of copper rail bonds. British firms can obtain further particulars from the Department of Overseas Trade, 35, Old Queen-street, London, S.W.1. Reference number AX9977 should be quoted.

**An Unprofitable Omnibus Service.**—Tynemouth and District Electric Traction Co., on behalf of the omnibus proprietors operating the service between North Shields and Newcastle via the coast road, has informed Tynemouth Watch Committee that the service is being operated at a heavy loss. In view of the alternative services between North Shields and Newcastle upon other routes this service could be dispensed with, but with a view to reducing the extent of the losses it is proposed to alter it to a forty-minute service.

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**Omnibuses in London.**—In reply to Sir W. Brass, the Home Secretary stated in the House of Commons last week that the numbers of omnibus licences in force in the Metropolitan area on January 1, 1913, and 1920, were 2,908 and 3,299 respectively, and that the number of omnibuses scheduled to ply for hire under the London Traffic Act, 1924, on January 1, 1930, was 4,877.

**Walsall Corporation** has decided that the joint service of omnibuses between Walsall and Wolverhampton, which has been run by the two corporations satisfactorily for an experimental period, shall as soon as practicable give place to trolleybuses between Walsall and Willenhall Market Place, and thence on the Wolverhampton Corporation trolleybus route to Wolverhampton.

**The Royal Assent.**—Among the Acts which received the Royal Assent on August 1 were the following: St. Helens Corporation (Trolley Vehicles) Provisional Order Act, 1930; Wolverhampton Corporation (Trolley Vehicles) Provisional Order Act, 1930; Bradford Corporation (Trolley Vehicles) Order Confirmation Act, 1930; Bradford Corporation (Trolley Vehicles) Provisional Order Act, 1930; and London United Tramways Act, 1930.

**Sunderland Tramways** carried 1,476,693 additional passengers during the past financial year compared with last year, and made a profit of £6,359. Mr. Charles Hopkins, the general manager, states that omnibus competition is taking at least £500 per annum of what he considers legitimate tramway revenue. The Town Clerk has been instructed to ascertain the legal position regarding the fares charged by omnibus companies plying in Sunderland.

**Municipal Tramways and Transport Association.**—At the annual conference of the Municipal Tramways and Transport Association, to be held at Harrogate from September 24 to 26, Mr. J. H. Gledhill, J.P., will present a paper on the "Transition of Transport between 1928 and 1930." Mr. W. Vane Morland, general manager of the Walsall Corporation Tramways and Motors, has been invited to submit a paper on "The Progress Made with the Development of Heavy-Oil Engines."

**A London Traffic Experiment.**—An experiment in the relief of traffic congestion in the west end of London is to be tried next month, when the number of omnibuses passing between 10 a.m. and 4 p.m. is to be limited. Fewer omnibuses in the streets will, it is anticipated, result in an appreciable speeding up of the traffic flow. The scheme, which has the co-operation of the Underground Company, will be progressive, the number of omnibuses taken off being increased until it reaches a maximum already agreed upon. Special checkers and the police will report on the result, and statistics will be furnished by the L.G.O.C. and the Underground.

**Belfast Omnibus Fares Inquiry.**—An inquiry has been held by the Northern Ireland Road Transport and Fares Tribunal into the application of the Belfast Corporation for authority to alter the omnibus fares. Mr. W. Chamberlain, general manager of the tramways, presenting the case for the Corporation, asked for a new scale involving 1d. increase in the maximum single fare on five routes and ½d. on another, and the abolition of return tickets on all routes. He said the omnibuses had been operating for 18 months and on the year's working there had been a loss of £20,714. This loss had been met by the profits on the tramways undertaking, but the management considered it inadvisable that the tramways section should continue to bear that burden. The proposed fares would place the omnibuses as near as possible on a working basis. Answering the Chairman (Sir Lynden Macassey), Mr. Chamberlain said the maximum tramways fare was 2d. and the maximum omnibus fare of 3d. applied from the city centre to the tramway terminus. The justification for the increase was the higher cost of the service and its greater expedition. Mr. Magill, representing Cherryvalley residents, said the increase would be 60 per cent., but Mr. Chamberlain disagreed, as, taken on a mileage basis, the increase would not be so much.

**Discipline at Bournemouth.**—A sub-committee of the Bournemouth Tramways Committee recently reported on the question of disciplinary measures and recommended that the present system by which cases of infringement of the regulations are dealt with by the heads of departments and the general manager should be improved. In a discussion opinion was expressed by some members that cases should be dealt with by the Tramways Committee. Alderman Empson declared that a disciplinary system based on government by the official laymen was not satisfactory. He thought that a record of penalties should be placed before the Committee. Councillor Mapp said no other tramways undertaking had a system such as that suggested by Alderman Empson. Councillor Wilkinson said that a man was not able to put his case before the manager himself, and proposed that a man should be allowed to have a trade union official as an advocate. Councillor Cartwright described this as a "very insidious proposal," and said he would resist the suggestion that for every minor dispute a trade union official should be brought in. Col. Peaty declared that the Tramways Committee should have more courage, and added: "If the tramway manager puts his foot on the chair and points his finger at them they are finished." Mr. I. Bulfin, the tramways manager, being called upon, said the present system had been in operation since 1912. Every case was considered by the head of the department and himself, and every member of the staff knew perfectly well what the punishment was before he infringed the regulations. The same system was enforced in every tramways undertaking in the country. It was decided to adhere to the present system, but that the book of punishments should be placed before the Committee at their meetings.

## FINANCIAL.

**City of Buenos Aires Tramways Co.**—A dividend of 1s. 3d. per share (at rate of 5 per cent., less tax, per annum) has been declared for the three months ended June 30.

**Bristol Tramways and Carriage Co., Ltd.,** have declared an interim dividend of 4 per cent., less income tax on the ordinary shares for the half-year ended June 30. A year ago the rate was the same.

**Sunderland Corporation Tramways** report for the year ended March 31 shows a profit of £6,359. The number of passengers carried was 30,813,966, being 1,476,693 more than the previous year.

**South Shields Tramways and Motors.**—After payment of operating expenses, there was a gross profit for the year ending March 31 of £18,560. After meeting all other charges, including interest and sinking fund, a surplus of £2,389 was carried forward.

**Lytham St. Annes Corporation Tramways** report a loss of £6,712 on the tramways, and of £2,550 on the omnibuses during the past financial year. Last year's combined loss was £5,304. On the tramways traffic receipts were less, but working expenses were lower, while on the omnibuses the traffic receipts were £144 less, but the expenses were higher.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended August 6 amounted to £77,350, a decrease of £3,277 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to August 6 (18 2-7 weeks), the total receipts were £1,516,325, a decrease of £10,235.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended July 19 give total receipts of £417,919, or £16,115 less than in the corresponding week of last year. The aggregate receipts for sixteen weeks amounted to £6,784,335, an increase of £124,010 over the corresponding period of last year.

**Grimsby Corporation Transport** for the year ended March 31 shows a net profit of £3,718. Tramway receipts decreased by £1,025, and working expenses by £3,278. Trolleybus receipts were lower by £108, and in spite of additional mileage of 7,588, working expenses were reduced by £144. Omnibus receipts totalled £29,088, and working expenses £20,906. Passengers carried were: tramways 8,323,428; trolleybuses 3,197,595; and petrol omnibuses, 4,663,480.

**Croydon Corporation Tramways.**—Councillor Keys, chairman of the Croydon Tramways Committee, in presenting the annual report, said that the estimated deficiency of £29,000 had been brought down to £24,000. Several factors had contributed towards this reduction. The number of passengers per car mile had slightly increased and the expenditure had been reduced by .65d. per car mile, which had effected a saving of something like £5,000. He did not suppose anyone in the Council would now talk about "tram scrapping." If they did, it would mean an annual charge of £15,000, which would have to be borne by the rates.

**Glasgow's Municipal Transport** undertaking is now again almost free from debt. The annual accounts show that since 1917, when the undertaking was last free of debt, large sums have been expended on extensions, widening and reconditioning of rolling stock. The indebtedness at present is £3,388,960. This is balanced by a sum of £3,387,992 in a depreciation and a renewals fund. The department has also about £100,000 in general reserve, third-party risk and other insurance funds. Taking these into account, there is a surplus of £90,000 over the indebtedness. Since 1894, when the Corporation began to work their tramways, the capital expenditure has amounted to £8,019,000. During that period £1,250,000 has been paid to the Common Good Fund of the Corporation, and £2,750,000 in city and county rates.

## PERSONAL.

**Mr. W. Chamberlain,** general manager of the Belfast Corporation Tramways, has presented to the Royal Victoria Hospital the £100 recently awarded him in his action for libel.

**Messrs. Longster Bros.,** of Pateley Bridge, have sold their omnibus interest to the West Yorkshire Road Car Co., Ltd. The latter company now command the sole running powers from Harrogate to Loft House.

**Mr. C. F. Wolsey,** of Sheffield, has been appointed traffic superintendent to Stockport Corporation Tramways in succession to Mr. Charles Sprowson, who has retired on account of ill-health after 28 years' service with the undertaking.

**Mr. Wallace Jones,** until recently a motorman on the Birmingham Corporation Tramways, has been appointed first tuba player in the famous Hallé Orchestra, Manchester. Mr. Jones, who is thirty years of age, came to Birmingham after his discharge from the Royal Marines.

**Mr. John Johnston,** a tramcar and latterly an omnibus conductor, and formerly with the Edinburgh and District Tramways Co., who has been in the service of Edinburgh Tramways for forty years, has received a presentation of a wallet containing over £30 on his retirement. He was described as a "model conductor."

**The Retirement of Mr. J. K. Bruce.**—The Council of the Municipal Transport and Tramways Association has placed on record their high appreciation of the services of Mr. J. K. Bruce, who recently retired from the position of general manager of the London County Council Tramways, and an expression of their sincere regret of the necessity which has led to his resignation. The Council express sympathy with Mr. Bruce in his illness, and hope that a respite rom duty will restore him to his normal health.

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**Mr. P. G. Campling,** borough electrical engineer and tramways manager at Great Yarmouth, has been appointed by the Central Electricity Board as district engineer in East England under the East England Electricity scheme. In May, 1922, Mr. Campling was appointed to his present position, and in later years was responsible for arranging bulk supplies to Lowestoft Corporation and the township of Bungay, as well as for rural supplies in an area of 200 square miles. Commenting on the appointment, the "Eastern Daily Gazette" said that whatever the responsibilities and duties attaching to the new appointment may be, the record of Mr. Campling at Yarmouth is guarantee enough that they will be fulfilled with ample energy and with supreme confidence in the future of electricity.

**The Recent Plymouth Prosecution.**—A prolonged debate took place at the meeting of Plymouth City Council on July 28, on a decision of the Tramways Committee that no further action be taken in connection with the recent proceedings against the late tramways manager. A proposal that the Committee minute be referred back and the papers sent to the Director of Public Prosecutions was defeated by 34 votes to 25.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name. | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate Wks. | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | Aug. 5 | 741 | 746 | + 5 | 18 | 10,468 | — 226 |
| „ Motor Buses ... | „ 5 | 247 | 303 | + 56 | 18 | 5,250 | + 835 |
| „ Total ... ... | „ 5 | 988 | 1,049 | + 61 | 18 | 15,718 | + 609 |
| Aberdeen Corp. ... | July 30 | 5,747 | 7,004 | + 1,257 | 8½ | 48,872 | — 450 |
| Ashton-u-Lyne Corp. | Aug. 2 | 882 | 848 | — 34 | 18 | 15,369 | — 1,146 |
| „ Motor Buses ... | „ 2 | 500 | 506 | + 6 | 18 | 9,030 | + 13 |
| „ Trolley Buses ... | „ 2 | 254 | 247 | — 7 | 18 | 4,705 | — 355 |
| „ Total ... ... | „ 2 | 1,636 | 1,601 | — 35 | 18 | 29,104 | — 1,488 |
| Ayr Corporation ... | „ 2 | 685 | 835 | + 150 | 11 | 7,752 | — 662 |
| Barrow Corporation... | July 19 | 767 | 602 | — 165 | 16 | 9,320 | — 674 |
| „ Motor Buses ... | „ 19 | 534 | 456 | — 78 | 16 | 6,423 | + 978 |
| „ Total ... ... | „ 19 | 1,301 | 1,058 | — 243 | 16 | 15,743 | — 304 |
| Belfast City ... ... | Aug. 1 | 10,447 | 11,244 | + 797 | 17¾ | 202,122 | + 7,685 |
| „ Motor Buses ... | „ 1 | 931 | 1,205 | + 274 | 17¾ | 23,284 | + 4,952 |
| „ Total ... ... | „ 1 | 11,378 | 12,449 | + 1,071 | 17¾ | 225,406 | + 12,637 |
| Birkenhead Corp. ... | „ 3 | 1,749 | 1,549 | — 200 | 18 | 28,416 | — 2,113 |
| „ Motor Buses ... | „ 3 | 6,034 | 4,161 | — 1,873 | 18 | 65,061 | + 1,620 |
| „ Total ... ... | „ 3 | 7,783 | 5,710 | — 2,073 | 18 | 93,477 | — 493 |
| Birmingham Corp. ... | July 29 | 27,335 | 25,840 | — 1,495 | 17 | 456,580 | — 9,778 |
| „ Motor Buses ... | „ 29 | 13,275 | 14,968 | + 1,693 | 17 | 263,170 | + 44,290 |
| „ Trolley Buses ... | „ 29 | 559 | 523 | — 36 | 17 | 9,496 | + 72 |
| „ Total ... ... | „ 29 | 41,169 | 41,331 | + 162 | 17 | 729,246 | + 34,584 |
| Blackburn Corp. ... | „ 30 | 1,891 | 1,757 | — 134 | 17¾ | 32,089 | — 2,092 |
| „ Motor Buses ... | „ 30 | Nil | 344 | + 344 | 17¾ | 5,275 | + 5,275 |
| „ Total ... ... | „ 30 | 1,891 | 2,101 | + 210 | 17¾ | 37,364 | + 3,183 |
| Bradford Corporation | Aug. 2 | 14,200 | 14,003 | — 197 | 18 | 256,673 | — 10,933 |
| Brighton Corporation | „ 3 | 3,328 | 3,381 | + 53 | 17¾ | 48,846 | + 2,133 |
| Burnley Corporation... | „ 2 | 3,022 | 2,755 | — 267 | | ... | ... |
| „ Motor Buses ... | „ 2 | 657 | 679 | + 22 | ... | ... | ... |
| „ Total ... ... | „ 2 | 3,679 | 3,434 | — 245 | ... | ... | ... |
| Burton-on-Trent Corp. | „ 3 | 882 | 865 | — 17 | 18 | 15,240 | + 556 |
| Bury Corporation ... | „ 3 | 1,960 | 1,820 | — 140 | 17¾ | 32,934 | — 4,342 |
| „ Motor Buses ... | „ 3 | 495 | 1,145 | + 650 | 17¾ | 19,697 | + 12,350 |
| „ Total ... ... | „ 3 | 2,455 | 2,965 | + 510 | 17¾ | 52,631 | + 8,008 |
| Cardiff Corporation ... | July 26 | 7,736 | 7,457 | — 279 | 16¾ | 130,996 | + 2,589 |
| Chatham and District | „ 17 | 1,393 | 1,226 | — 167 | 28 | 31,693 | + 1,248 |
| Chester Corporation ... | „ 27 | 429 | Nil | — 429 | 17 | Nil | — 7,612 |
| „ Motor Buses ... | „ 27 | Nil | 694 | + 694 | 17 | 11,173 | + 11,173 |
| „ Total ... ... | „ 27 | 429 | 694 | + 265 | 17 | 11,173 | + 3,561 |
| Chesterfield Corp. ... | Aug. 4 | 2,221 | 2,080 | — 141 | 18 | 33,859 | + 1,075 |
| Colchester Corp. ... | „ 6 | 730 | 819 | + 89 | 19 | 11,544 | + 1,325 |
| Colne Corporation ... | July 30 | 685 | 723 | + 38 | 17 | 12,310 | — 74 |
| Coventry Corporation | Aug. 3 | 2,121 | 1,976 | — 145 | 18 | 36,517 | — 2,177 |
| „ Motor Buses ... | „ 3 | 1,567 | 1,802 | + 235 | 18 | 32,817 | + 4,525 |
| „ Total ... ... | „ 3 | 3,688 | 3,778 | + 90 | 18 | 69,334 | + 2,348 |
| Darlington Corp. ... | „ 2 | 1,032 | 1,095 | + 63 | 17⅝ | 19,025 | + 1,773 |
| Derby Corporation ... | „ 2 | 2,524 | 2,428 | — 96 | 18 | 43,897 | — 840 |
| „ Motor Buses ... | „ 2 | 778 | 883 | + 105 | 18 | 16,378 | + 3,950 |
| „ Total ... ... | „ 2 | 3,302 | 3,311 | + 9 | 18 | 60,275 | + 3,110 |
| Dover Corporation ... | „ 2 | 486 | 521 | + 35 | 18 | 7,419 | + 260 |
| Dundee Corporation... | July 22 | 2,578 | 2,583 | + 5 | 9¾ | 25,332 | — 841 |
| „ Motor Buses ... | „ 22 | 838 | 1,197 | + 359 | 9¾ | 10,296 | + 2,086 |
| „ Total ... ... | „ 22 | 3,416 | 3,780 | + 364 | 9¾ | 35,628 | + 1,245 |
| East Ham Corp. ... | Aug. 2 | 2,221 | 2,224 | + 3 | 17¾ | 40,912 | + 788 |
| Edinburgh Corp. ... | July 26 | 14,581 | 15,957 | + 1,376 | 10¾ | 162,712 | + 1,330 |
| „ Motor Buses ... | „ 26 | 3,365 | 3,706 | + 341 | 10¾ | 41,053 | + 2,987 |
| „ Total ... ... | „ 26 | 17,946 | 19,663 | + 1,717 | 10¾ | 203,765 | + 4,317 |
| Exeter Corporation ... | Aug. 6 | 962 | 868 | — 94 | 19 | 15,502 | — 733 |
| „ Motor Buses ... | „ 6 | 195 | 431 | + 236 | 19 | 5,442 | + 3,000 |
| „ Total .. ... | „ 6 | 1,157 | 1,299 | + 142 | 19 | 20,944 | + 2,267 |
| Glasgow Corporation... | „ 2 | 42,082 | 37,676 | — 4,406 | 9 | 382,052 | + 2,178 |
| „ Motor Buses ... | „ 2 | 5,152 | 6,692 | + 1,540 | 9 | 70,884 | + 27,698 |
| „ Total ... ... | „ 2 | 47,234 | 44,368 | + 2,866 | 9 | 452,936 | + 29,876 |
| Gloucester Corp. .. | July 23 | 571 | 681 | + 110 | 16¾ | 11,561 | + 2,571 |
| Grimsby Corporation | Aug. 2 | 1,517 | 1,727 | + 210 | 18 | 27,788 | + 3,444 |
| Halifax Corporation | July 29 | 4,558 | 5,233 | + 675 | 17½ | 89,589 | + 10,465 |
| Huddersfield Corp. ... | Aug. 2 | 6,232 | 6,431 | + 199 | 18 | 114,709 | — 1,461 |
| Hull Corporation ... | „ 2 | 5,751 | 5,529 | — 222 | 18 | 102,480 | — 1,380 |
| „ Motor Buses ... | „ 2 | 1,380 | 1,711 | + 331 | 18 | 27,117 | + 3,565 |
| „ Total ... ... | „ 2 | 7,131 | 7,240 | + 109 | 18 | 129,597 | + 2,185 |
| Ilford Corporation ... | „ 2 | 1,416 | 1,430 | + 14 | 17¾ | 27,168 | + 601 |
| Ipswich Corp. Trol.Bus | „ 2 | 1,349 | 1,418 | + 69 | 17¾ | 23,870 | + 1,487 |
| Isle of Thanet ... | July 30 | 1,944 | 1,679 | — 265 | 30½ | 20,376 | — 1,429 |
| Kilmarnock Corp. ... | Aug. 2 | 481 | 544 | + 63 | 11½ | 5,680 | + 276 |
| Lancashire Un. ... | July 27 | 2,267 | 1,991 | — 276 | 29¾ | 63,624 | — 3,325 |
| „ Motor Buses ... | „ 27 | 4,717 | 5,517 | + 800 | 29¾ | 144,245 | + 20,820 |
| Leeds Corporation ... | Aug. 2 | 18,977 | 19,645 | + 668 | 17¾ | 359,706 | + 9,276 |
| Leicester Corp. ... | „ 2 | 8,586 | 8,575 | — 11 | 18 | 150,743 | + 1,122 |
| Lincoln Corp. ... | July 26 | 957 | 919 | — 38 | 16 | 14,840 | + 41 |
| Liverpool Corp. ... | Aug. 2 | 28,889 | 29,961 | + 1,072 | 17¾ | 536,825 | + 3,330 |
| London County Coun | „ 6 | 80,627 | 77,350 | — 3,277 | 18¾ | 1,516,325 | — 10,235 |
| Luton Corporation ... | July 30 | 414 | 411 | — 3 | 17¾ | 7,552 | + 348 |
| Maidstone Corp. ... | „ 31 | 206 | Nil | — 206 | 17¾ | Nil | — 4,291 |
| „ Motor Buses ... | „ 31 | 278 | 271 | — 7 | 17¾ | 4,877 | + 1 |
| „ Trolley Buses ... | „ 31 | 294 | 596 | + 302 | 17¾ | 10,863 | + 5,466 |
| „ Total ... ... | „ 31 | 778 | 867 | + 89 | 17¾ | 15,740 | + 1,176 |
| Manchester Corp. ... | Aug. 2 | 32,666 | 31,235 | — 1,431 | 18 | 577,539 | — 49,621 |
| „ Motor Buses ... | „ 2 | 4,765 | 8,529 | + 3,764 | 18 | 154,189 | + 64,382 |
| „ Total ... ... | „ 2 | 37,431 | 39,764 | + 2,333 | 18 | 731,728 | + 14,761 |
| Middlesbrough Corp. | July 29 | 1,096 | 972 | — 124 | 17½ | 18,141 | — 1,205 |
| „ Motor Buses ... | „ 29 | 491 | 584 | + 93 | 17½ | 9,827 | + 1,108 |
| „ Total ... ... | „ 29 | 1,587 | 1,556 | — 31 | 17½ | 27,968 | — 97 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate Wks. | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Tv.Corp. | Aug. 2 | 10,065 | 8,647 | — 1,418 | 17¾ | 156,760 | — 21,697 |
| „ Motor Buses ... | „ 2 | 1,983 | 3,351 | + 1,368 | 17¾ | 53,946 | + 17,413 |
| „ Total ... ... | „ 2 | 12,048 | 11,998 | — 50 | 17¾ | 210,706 | + 4,284 |
| Newport Corporation | July 26 | 1,678 | 1,507 | — 171 | 17 | 26,986 | — 1,069 |
| „ Motor Buses ... | „ 26 | 763 | 741 | + 22 | 17 | 13,631 | + 1,009 |
| „ Total ... ... | „ 26 | 2,441 | 2,248 | — 193 | 17 | 40,617 | — 60 |
| Northampton Corp. ... | Aug. 1 | 1,164 | 1,141 | — 23 | 17¾ | 19,383 | — 413 |
| „ Motor Buses ... | „ 1 | 703 | 739 | + 36 | 17¾ | 12,799 | + 1,360 |
| „ Total ... ... | „ 1 | 1,867 | 1,880 | + 13 | 17¾ | 32,182 | + 957 |
| Nottingham Corp. ... | July 31 | 6,443 | 5,796 | — 647 | 17¾ | 101,794 | — 14,180 |
| „ Motor Buses ... | „ 31 | 2,234 | 3,403 | + 1,169 | 17¾ | 58,080 | + 19,658 |
| „ Trolley Buses ... | „ 31 | 574 | 1,223 | + 649 | 17¾ | 21,124 | + 10,732 |
| „ Total ... ... | „ 31 | 9,251 | 10,422 | + 1,171 | 17¾ | 180,998 | + 15,210 |
| Oldham Corporation | Aug. 2 | 3,404 | 3,336 | — 68 | 19 | 63,433 | — 4,787 |
| „ Motor Buses ... | „ 2 | 1,994 | 2,033 | + 39 | 19 | 38,024 | — 962 |
| „ Total ... ... | „ 2 | 5,398 | 5,369 | — 29 | 19 | 101,457 | — 5,749 |
| Plymouth Corp. ... | „ 2 | 3,722 | 3,866 | + 144 | 17¾ | 65,134 | — 1,963 |
| „ Motor Buses ... | „ 2 | 1,927 | 2,647 | + 720 | 17¾ | 43,010 | + 9,153 |
| „ Total ... ... | „ 2 | 5,649 | 6,513 | + 864 | 17¾ | 108,144 | + 7,190 |
| Portsmouth Corp. ... | „ 2 | 5,302 | 5,299 | — 3 | 18 | 73,298 | — 5,882 |
| „ Motor Buses ... | „ 2 | 2,284 | 3,959 | + 1,675 | 18 | 59,319 | + 23,978 |
| „ Total ... ... | „ 2 | 7,586 | 9,258 | + 1,672 | 18 | 132,617 | + 18,096 |
| Preston Corporation... | July 30 | 1,845 | 1,694 | — 151 | 17¾ | 29,016 | — 1,455 |
| „ Motor Buses ... | „ 30 | 523 | 527 | + 4 | 17¾ | 9,008 | + 599 |
| „ Total ... ... | „ 30 | 2,368 | 2,221 | — 147 | 17¾ | 38,024 | — 856 |
| Rawtenstall Corp. ... | „ 27 | 768 | 603 | — 165 | 16¾ | 11,323 | — 3,251 |
| „ Motor Buses ... | „ 27 | 487 | 666 | + 179 | 16¾ | 11,855 | + 2,780 |
| „ Total ... ... | „ 27 | 1,255 | 1,269 | + 14 | 16¾ | 23,178 | — 471 |
| Reading Corporation | „ 31 | 1,501 | 1,405 | — 96 | 18 | 25,191 | — 1,077 |
| „ Motor Buses ... | „ 31 | 895 | 1,012 | + 117 | 18 | 17,814 | + 1,896 |
| „ Total ... ... | „ 31 | 2,396 | 2,417 | — 21 | 18 | 43,005 | + 819 |
| Rochdale Corp. ... | Aug. 2 | 3,008 | 2,748 | — 260 | ... | 49,093 | — 4,227 |
| „ Motor Buses ... | „ 2 | 1,573 | 1,507 | — 66 | ... | 28,005 | + 295 |
| „ Total ... ... | „ 2 | 4,581 | 4,255 | — 326 | .. | 77,098 | — 3,932 |
| Rotherham Corp. ... | July 28 | 2,640 | 2,766 | + 126 | 17 | 46,956 | + 2,153 |
| Salford Corporation ... | Aug. 2 | 10,528 | 10,511 | — 17 | 17¾ | 202,180 | + 2,569 |
| Sheffield Corp. ... | „ 2 | 20,271 | 19,592 | — 678 | 17¾ | 350,466 | — 3,993 |
| Southampton Corp. ... | July 30 | 3,348 | 3,627 | + 279 | 18 | 59,310 | + 496 |
| „ Motor Buses ... | „ 30 | 785 | 866 | + 81 | 18 | 15,304 | + 2,312 |
| „ Total ... ... | „ 30 | 4,133 | 4,493 | + 360 | 18 | 74,614 | + 2,808 |
| Southend-on-Sea Corp. | Aug. 6 | 3,811 | 3,384 | — 427 | 18¾ | 40,709 | — 2,135 |
| „ Trolley Buses ... | „ 6 | 461 | 545 | + 84 | 18¾ | 5,779 | + 2,580 |
| „ Total ... ... | „ 6 | 4,272 | 3,929 | — 343 | 18¾ | 46,488 | + 445 |
| Southport Corp. ... | „ 2 | 1,508 | 1,526 | + 18 | 17½ | 24,094 | — 109 |
| „ Motor Buses ... | „ 2 | 431 | 507 | + 76 | 17½ | 7,686 | + 827 |
| „ Total ... ... | „ 2 | 1,939 | 2,033 | + 94 | 17½ | 31,780 | + 718 |
| St. Helens Corp. ... | July 26 | 1,899 | 2,010 | + 111 | 17 | 34,978 | + 2,281 |
| Sunderland Corp. ... | Aug. 5 | 2,894 | 3,302 | + 408 | 18 | 46,349 | + 1,849 |
| „ Motor Buses ... | „ 5 | 354 | 780 | + 426 | 18 | 9,705 | + 6,353 |
| „ Total ... ... | „ 5 | 3,248 | 4,082 | + 834 | 18 | 56,054 | + 8,202 |
| Swindon Corp. .. | July 30 | 823 | 951 | — 128 | 17¾ | 16,888 | + 4,044 |
| Wallasey Corp. ... | Aug 2 | 1,370 | 1,349 | — 21 | 17½ | 22,537 | — 1,845 |
| „ Motor Buses ... | „ 2 | 2,277 | 2,775 | — 498 | 17½ | 42,442 | + 4,488 |
| „ Total ... ... | „ 2 | 3,647 | 4,124 | — 477 | 17½ | 64,979 | + 2,643 |
| Walsall Corporation... | July 27 | 2,373 | 2,412 | — 39 | 17 | 58,678 | + 1,512 |
| Walthamstow Corp. ... | Aug. 2 | 2,397 | 2,445 | + 48 | 17¾ | 44,422 | + 141 |
| Warrington Corp. ... | July 31 | 856 | 865 | + 9 | 18 | 15,898 | + 50 |
| „ Motor Buses ... | „ 31 | 432 | 482 | + 50 | 18 | 9,015 | + 1,090 |
| „ Total ... ... | „ 31 | 1,288 | 1,347 | + 59 | 18 | 24,913 | + 1,140 |
| West Ham Corp. ... | „ 31 | 5,800 | 5,805 | + 5 | 17¾ | 106,843 | + 2,539 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | „ 27 | 2,665 | 2,316 | — 349 | 17 | 41,269 | — 6,323 |
| „ Trolley Buses ... | „ 27 | 3,175 | 3,351 | — 176 | 17 | 59,928 | + 3,651 |
| „ Total ... ... | „ 27 | 5,840 | 5,667 | — 173 | 17 | 101,197 | — 2,672 |
| York Corporation ... | „ 30 | 987 | 1,019 | + 32 | 18 | 18,277 | — 18 |
| „ Motor Buses ... | „ 30 | 381 | 494 | + 113 | 18 | 8,862 | + 2,332 |
| „ Trolley Buses ... | „ 30 | 48 | Nil | — 48 | 18 | Nil | — 908 |
| „ Total ... ... | „ 30 | 1,416 | 1,513 | + 97 | 18 | 27,139 | + 1,406 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or M | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Aug. 5 | £84,394 | £79,200 | 31 w | £2,577,341 | — £105,433 |
| Brazilian Traction $ | June | 4,210,893 | 4,146,884 | 6 m | 24,286,359 | + 249,334 |
| British Columbia $ | June | 1,133,017 | 1,144,585 | 12 m | 14,658,732 | + 610,860 |
| Buenos Aires Lacroze | Aug. 3 | 11,292 | 10,738 | 5 w | 51,188 | — 5,599 |
| Burma E. Sup. Co. Rs. | June | 63,157 | 66,317 | 11 m | 709,845 | — 18,866 |
| Calcutta ... Rs. | Aug. 2 | 123,395 | 104,921 | 30½ w | 3,438,583 | — 465,573 |
| Cape Town ... | June | 27,995 | 25,525 | ... | ... | ... |
| Carthagena & Herrerias | July | 1,100 | 738 | 7 m | 6,350 | — 571 |
| Durban ... ... | May | 24,518 | 23,945 | 10 m | 238,483 | — 714 |
| East India ... ... | July | 3,801 | 3,833 | 12 m | 45,460 | + 470 |
| Kalgoorlie ... ... | Apr. | 1,673 | 1,718 | 4 m | 6,319 | Nil |
| Madras (2 weeks) Rs. | July 31 | 42,239 | 45,091 | 30 w | 646,057 | + 33,452 |
| Para ... ... | June | 15,450 | 15,028 | 7 m | 103,807 | + 749 |
| Port Elizabeth ... | June | 7,335 | 6,951 | ... | ... | ... |
| Rangoon ... Rs. | July | 122,630 | 151,300 | 7 m | 1,050,935 | + 219,494 |
| Shanghai ... $ | June | 335,740 | 367,231 | 6 m | 1,923,202 | — 42,708 |
| Singapore ... ...$ | June | 123,000 | 140,000 | 9 m | 1,223,000 | + 140,000 |
| Winnipeg ... ...$ | June | 517,738 | 479,958 | 6 m | 3,273,504 | — 66,574 |

## RAILWAY RECEIPTS.

| 31st Week ended Aug. 3rd | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 423,000 | — 14,000 | 316,000 | — 31,000 | 739,000 | — 45,000 | — 785,000 |
| L.M.S.R. | 970,000 | — 67,000 | 717,000 | — 74,000 | 1,687,000 | — 141,000 | —2,298,000 |
| L.N.E.R. | 580,000 | — 35,000 | 602,000 | — 74,000 | 1,182,000 | — 109,000 | —1,349000 |
| S.R. | 527,000 | — 27,000 | 111,000 | — 5,000 | 638,000 | — 32,000 | — 225,000 |
| Totals | 2,500,000 | — 143,000 | 1,746,000 | — 184,000 | 4,246,000 | — 327,000 | —4,657,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or − | Aggregate. 1930. | + or − |
|---|---|---|---|---|---|---|
| LONDON UNDERGROUND | | | | | | |
| Common Fund Cos. | Aug. 2 | 279,700 | 300,000 | + 20,300 | 9,358,400 | + 590,000 |
| Lond. & Sub. Group | „ 2 | 42,100 | 44,500 | + 2,400 | 1,367,100 | + 99,100 |
| METROPOLITAN RAILWAY | „ 2 | 38,500 | 38,300 | — 200 | 1,141,900 | + 24,500 |
| LIVERPOOL OVERHEAD | „ 3 | 1,852 | 1,906 | + 54 | 48,178 | — 2,705 |
| MERSEY RAILWAY ... | „ 2 | 4,388 | 4,377 | — 11 | 141,629 | + 4,372 |

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THE Tramway & Railway World
WITH OMNIBUS & COACH SECTION

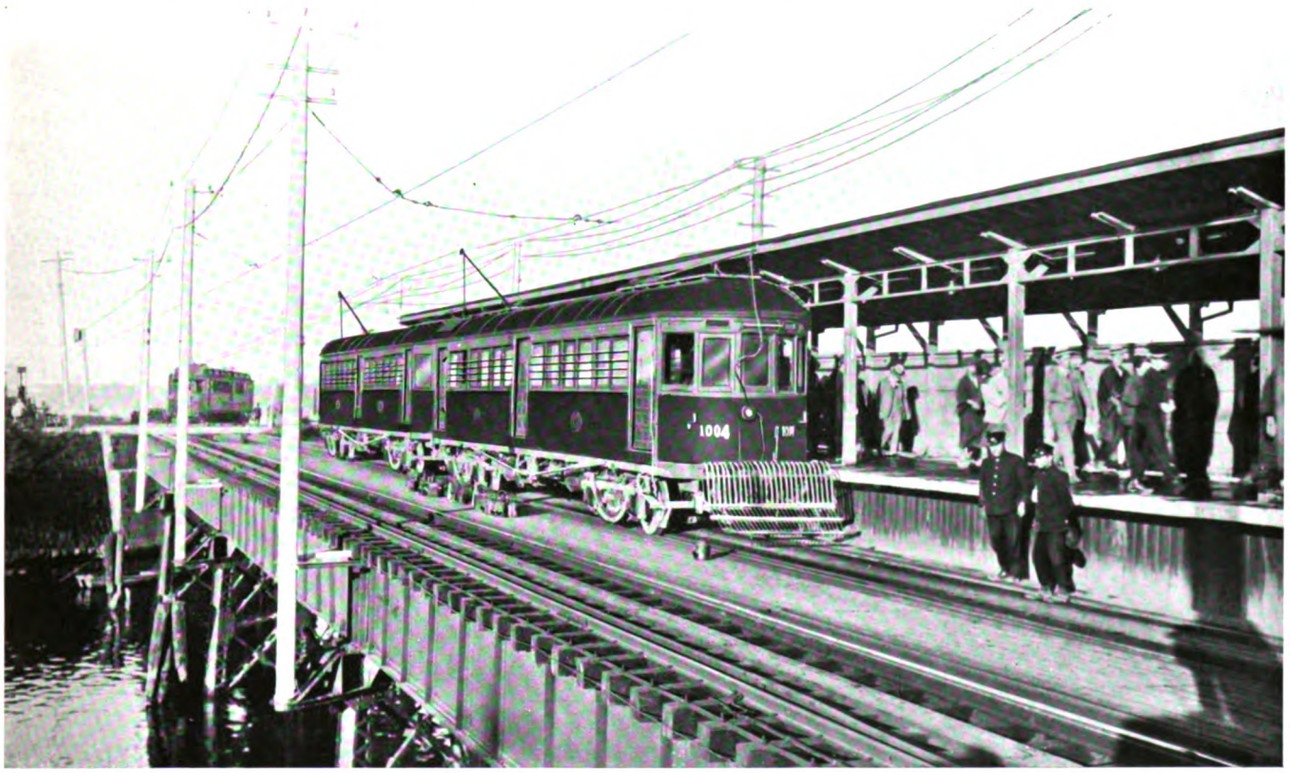
Founded 1892 LONDON, AUGUST 14, 1930 VOL. LXVIII

# A JAPANESE RAILWAY ELECTRIFICATION.

ENGLISH ELECTRIC EQUIPMENT ON THE SHIN KEIHAN LINE.

Important contracts for the equipment of the seven sub-stations of the Shin Keihan Electric Railway and for the supply of motors and control gear for the rolling-stock have been completed by the English Electric Co., Ltd. The circumstances attending the construction of this new railway are of more than ordinary interest. Its inauguration was preceded in 1910 by the opening of the Keihan Electric Railway, which, until the construction of the Shin Keihan Railway, was the only electric line connecting Osaka, the largest industrial city of Japan, with Kyoto, the old capital. Until then this busy district was served only by the steam railway of the Imperial Government.

The Keihan Company's electric service, in course of time, became one of the busiest railways in the country, and means had to be considered for the relief of congestion. The steam trains of the Imperial Government Railways cover the distance of about thirty miles between the two cities in approximately forty-five minutes, but they run at infrequent intervals. Electric trains of the Keihan Company give a very frequent service at intervals of three minutes, with express trains every ten minutes which complete a longer journey in seventy minutes. The new Shin Keihan line provides an electric express service at intervals of thirty minutes which covers the distance of 25½ miles in thirty-eight minutes; stopping trains run every twelve minutes, and are scheduled to do the journey in fifty-two minutes. There is an underground extension of the line from the Saiin terminus in Kyoto to Shijyo Kawaramachi, and a branch has been constructed to Arashiyama, one of the most attractive places in the country. The view of Arashiyama station reproduced elsewhere gives some indication of a distinctly national layout suitable for handling large volumes of tourist traffic.




Motor Coach Train at a Terminal Station of the Keihan Railway.

In planning the Shin Keihan Railway the engineers had the dual aim of relieving the older line by running an express service between the two cities and of serving the numerous villages on the west side of the

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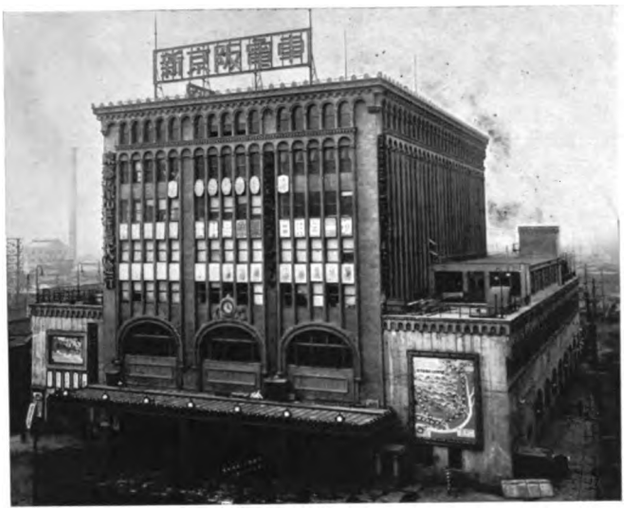
River Yodogawa. The necessary permission having been obtained from the Government and the land purchased, the track was run almost parallel to the Imperial Government steam line, as shown in the accompanying outline map. The engineers endeavoured throughout to secure as much straight track as possible. An indication of the success attained is given by the accompanying illustrations. The longest length of track without a curve is six miles; the minimum radius 20 chains, and the steepest gradient one in a hundred. The illustration above shows the Tenroku terminus at Osaka.



Tenroku Terminus, Osaka.

In accordance with the recommendation of the Imperial Government Railways for all new railway electrifications in Japan, the 1,500-volt direct-current system was adopted. Two large sub-stations were erected, one at Shojaku, and the other at Mukomachi, each with a capacity of 6,000 KW., and with space for extensions up to 9,000 KW. Both sub-stations are similar in construction, and are equipped with 750-volt rotary converters operating in pairs in series for the supply of the 1,500-volt overhead lines. These 1,500-volt rotary converters, which are among the largest of their type in Japan, are of the English Electric Company's tap-started design, and have shunt windings separately excited from an exciter fitted to one machine of each pair. They are equipped with roller bearings having oil lubrication and run at a speed of 600 R.P.M. Control is by means of the "English Electric" automatic switching equipments embodying their electrically-driven camshaft controllers. Power is supplied to the sub-stations by 22,000-volt, 60-cycle, 3-phase feeders, and this supply is stepped down by two 3,200-KVA. 3-phase transformers in each station, one transformer serving a pair of 1,500-KW. series-connected converters.

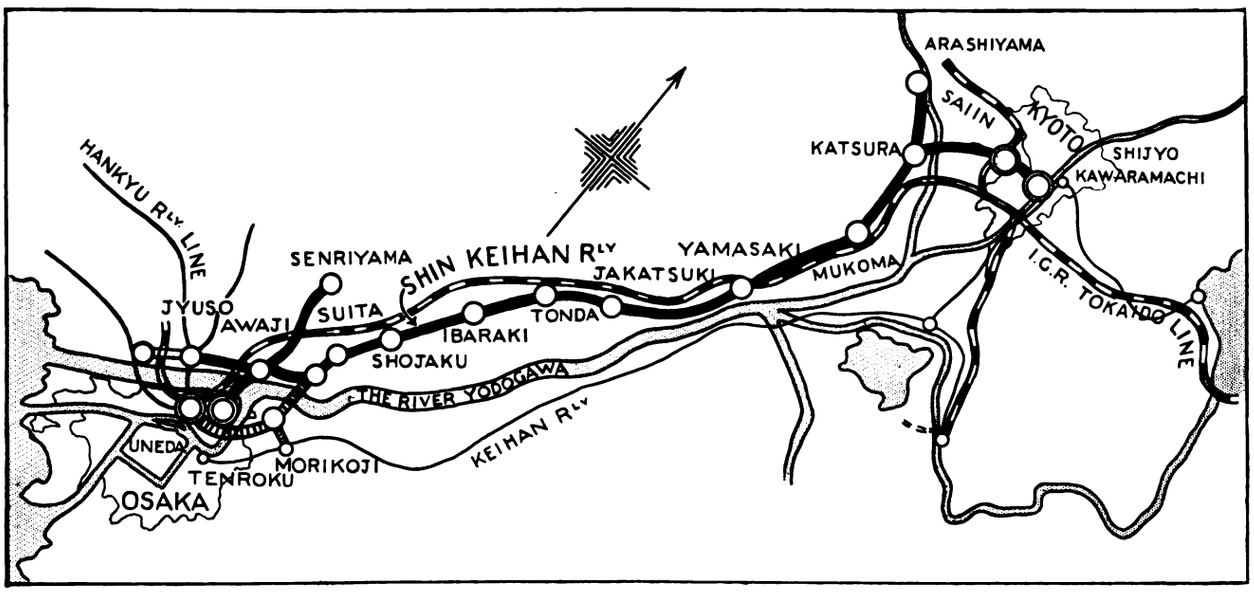
An illustration of the interior of the Mukomachi sub-station is given on page 66. Both the Shojaku and Mukomachi sub-stations operate in parallel, and are linked at Takatsuki through high-speed circuit-breakers. The 22,000-volt switch-gear is housed in stone-work cubicles, and the oil-breakers are operated by D.C. solenoid gear.

Starting up and synchronising of each of the 3,000-KW. 1,500-volt units, that is to say, a pair of converters, takes place automatically after the attendant has closed the control switch, and full protection is provided, both on the D.C. side and on the A.C. supply, by means of high-speed circuit-breakers, and the various protective devices referred to in detail later on.

The starting switchgear in each sub-station comprises a camshaft controller and relay panel for each machine, these panels being mounted below the switch gallery.

The sequence of operations at starting up is as follows:—

Provided the master inter-locking circuit is correct, thus ensuring that the two camshaft controllers for the pair of machines are in the correct starting positions, that the D.C. positive contactor and high-speed breaker are open, and that the incoming supply is available, both converters start up when the control switch is operated. The main oil-breaker first closes, and the camshaft controllers apply the necessary low-voltage to the converters which then run up with their fields short-circuited for an interval across




Sketch Map of Railways between Osaka and Kyoto.

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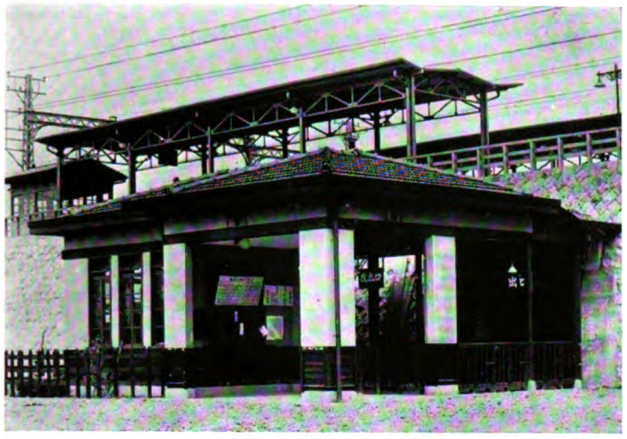
## VIEWS ON THE SHIN KEIHAN RAILWAY, JAPAN.



Nishikyogoku Station.

Arashiyama Station.

One of the Car Sheds.

An Electric Coach Lifting Jack.

Shojaku Station.

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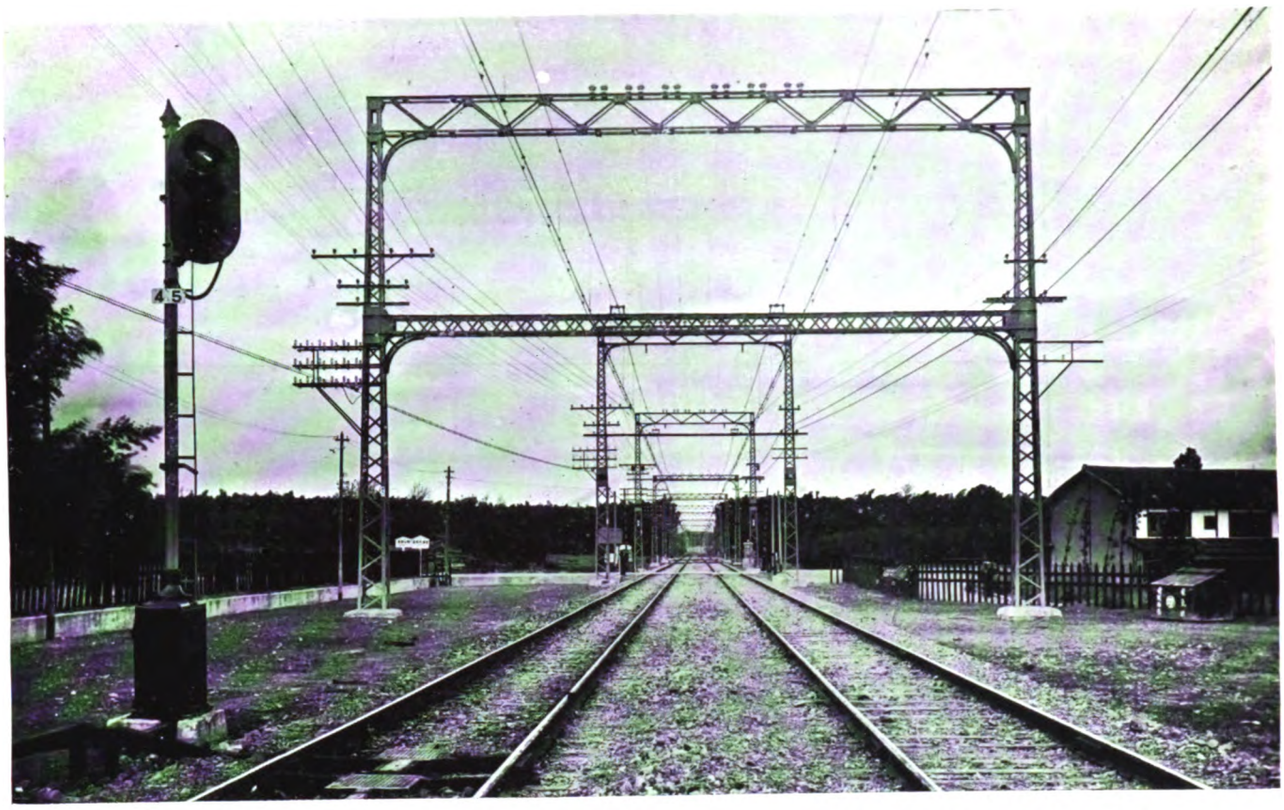
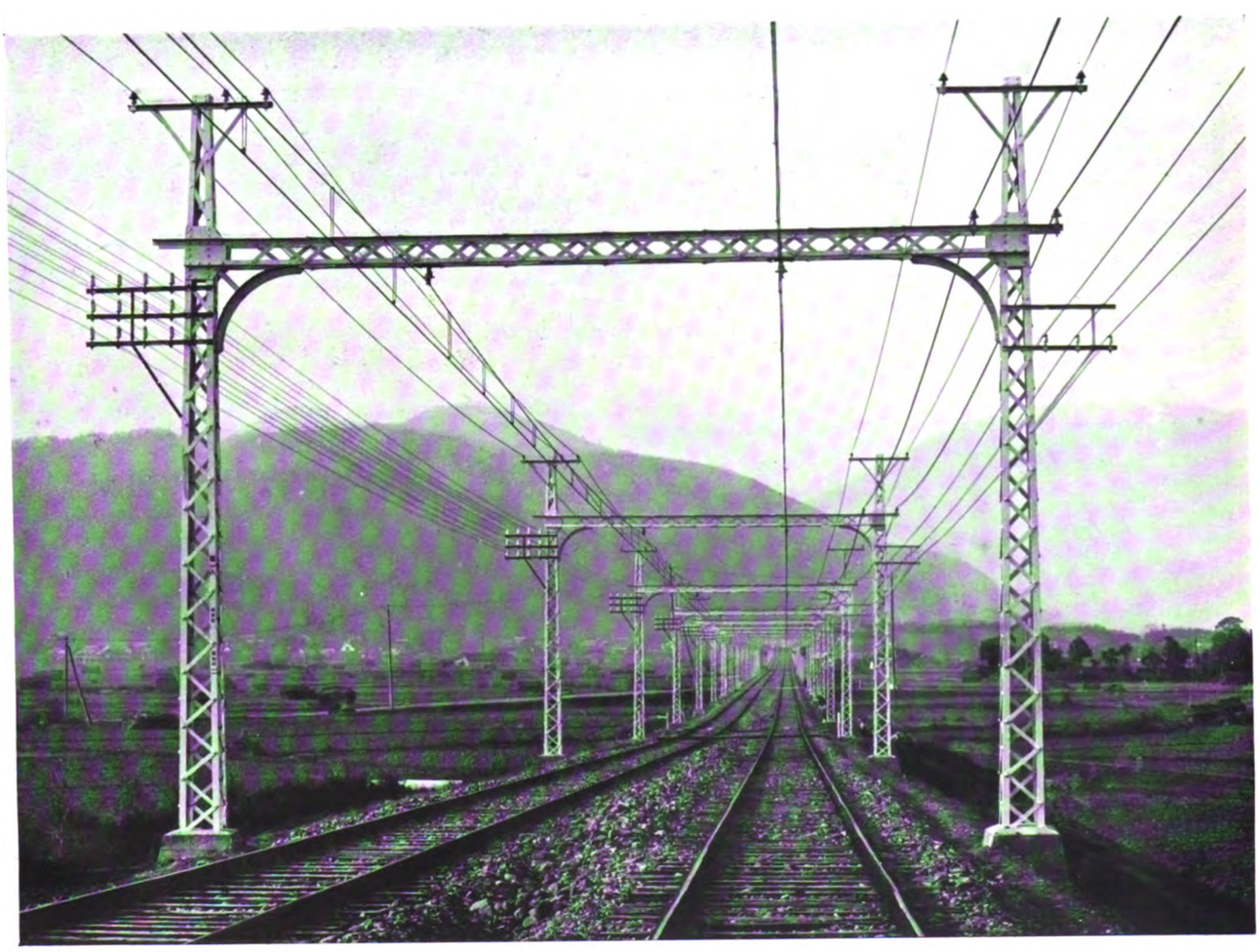


A View of the Track and Overhead Equipment.—The Shin Keihan Electric Railway, Japan.



Another View showing a Stretch of Straight Track.

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discharge resistances. As the exciter is direct-coupled to one of the converters its voltage begins to build up, and when it has reached 80 per cent. of its full value the field-making relays of both machines begin to move against a time lag. After an interval of about twenty seconds, one pair of contacts on the relay of one machine connects the converter field across the exciter through a reducing resistance, thereby pulling that machine into synchronism on a weak field. After a further interval of about ten seconds the relay of the other machine closes, and it also is brought into synchronism.

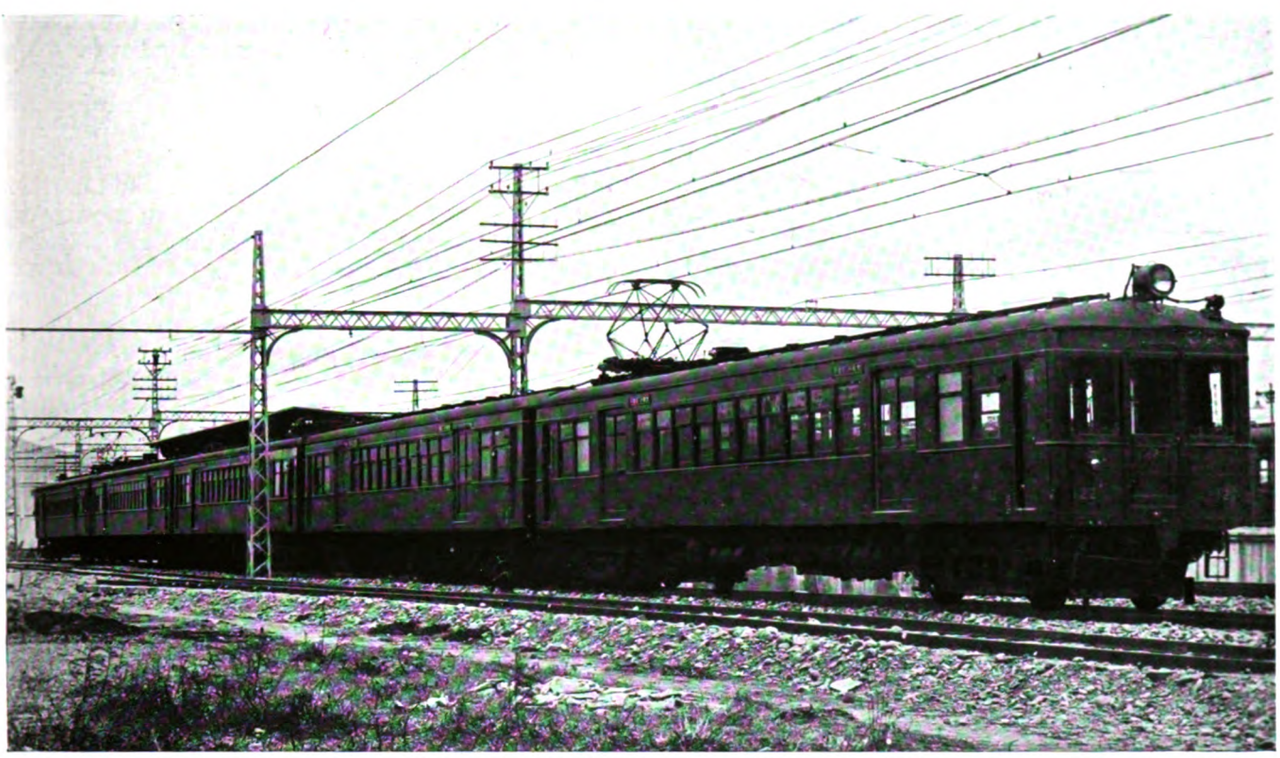
Correct polarity is checked by a synchronising relay on each machine, which also brings about the further rotation of the camshaft controller, by means of which the slip-rings are disconnected from the tap voltage and connected to the full voltage, first through chokers and then direct, and the field discharge and reducing resistances are cut out. The controller takes less than three seconds to complete the above-mentioned operations.

Upon reaching the full running position the controller is brought to rest by the opening of a contact which de-energises the camshaft motor relay and short-circuits the armature of this motor, thereby bringing it sharply to rest. The controllers of the two machines of a pair follow the same sequence with a brief time interval which is determined by the difference in timing of the respective field-making relays.

When both controllers reach the full running position a white lamp on the D.C. board lights up and thus indicates to the attendant that he can close the main D.C. breakers. The negative high-speed breakers are first closed and then the positive contactor, and the unit is ready to take load. An inter-lock is provided so that the high-speed breakers must be closed first. The 3,000-ampere machine high-speed breakers are situated in the negative lead of the pair, and between the positive of the low machine and the commutation pole circuit of the two machines respectively. A contactor of the same rating, with maximum, reverse and low-voltage releases, is connected in the positive lead of the machine pair.

Finally, the D.C. feeder high-speed and slow-speed breakers are closed by a control switch and manual operation respectively, and here again an inter-lock is provided to ensure that the high-speed breaker is closed first.

When any of the D.C. contactors, high-speed circuit-breakers or A.C. oil-breakers trip, an alarm bell rings until the attendant moves the control switch of the breaker which has operated to the "off" position. When a unit shuts down, due either to the attendant tripping an oil-breaker, or by the operation of an automatic trip, a circuit is completed to the camshaft motors and relays of both controllers, and these immediately run back to the start position, thereby leaving the equipment ready for restarting.



A Five-Coach Train on the Shin Keihan Railway.

The following is a brief summary of the protective features of the equipment :—

A heavy overload or short-circuit on the D.C. side will usually cause the feeder slow-speed or high-speed circuit-breaker to trip, and in the event of a very severe short-circuit the machine high-speed breaker will trip. Protection is also given against over-speed, field failure, A.C. over-load, A.C. under-voltage or failure, and D.C. reverse current.

Electrical equipment for the sub-stations and rolling-stock of the Keihan Electric Railway was also supplied by the English Electric Co., Ltd., and since the opening of the line in 1910 the equipments have undergone the severest possible test. For some years the Keihan Company had its own power house equipped with Willans Dick-Kerr machinery, but in consequence of standardisation of frequency, and the erection of large hydro-electric power stations in the district, the

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company decided to shut down their own plant and to purchase electrical energy from the Daido Company. The supply from Daido is received at 55,000 volts, 60 cycles, and is stepped down at Moriguchi, Fushimi, and Takatsuki to 22,000 volts, and distributed at this pressure by duplicate feeders to the various sub-stations. In addition to supplying power for their railway the Keihan Company also give a service for industrial and lighting purposes.

Power is delivered to the motors of trains from an overhead trolley wire at 600 volts and the negative of the system is earthed. The whole of the equipment for the sub-stations was supplied by the English

Electrified Track going under Main I.G.R. Line.

Electric Co.; it comprises thirteen 1,000-KW. rotary converters, with complete automatic or manual control apparatus. Three of the seven sub-stations were not converted to automatic control until the middle of 1928.

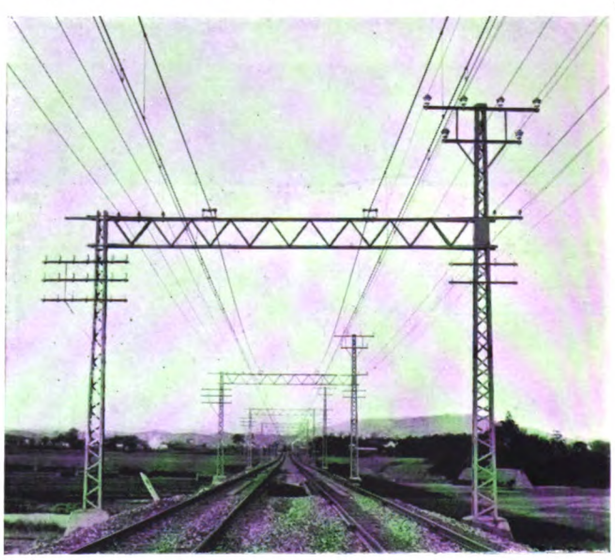
The method of control used in the sub-stations was decided upon by the Keihan Company's engineers after careful study of the service conditions to be met, and in close co-operation with the engineers of the English Electric Co. The central feature of the automatic switching equipment is the camshaft controller of the type which the English Electric Co. has installed so widely, both for this class of work and also for the control of electric rolling-stock.

Each of the sub-stations is arranged so that it can be operated alternatively by time-switch control or remote control. It is of interest to record an experience which occurred in operating these plants. It was found that, due to the falling voltage characteristic, the Hashimoto sub-station backed off from the peak loads and the manual sub-stations on either side at Fushimi and Hirakata were more evenly loaded. On the other

Interior of Mukomachi Sub-station.

hand Tofukuji sub-station, being level compound-wound, did not do this, and the second rotary often had to come into service for short periods to take care of these peak loads. This station has therefore been altered to shunt-wound, in order that the peak loads might pass on to the manual Fushimi sub-station, which, by reason of its larger capacity, could deal with them without the necessity of starting up another unit. It is also intended to alter the Gamo and Neyagawa sub-stations to shunt winding.

The traffic schedule of the Keihan line is very consistent, and there is a steady basic load which hardly varies. Consequently, the system of starting and stopping the first machine in each sub-station at a definite time was chosen, and this has been thoroughly justified. Extra load, due to rush hours during the day, or on particular days due to festivals or holidays, is provided for by the second unit coming into operation by the overload device or emergency time-switch. For example, to consider again the Tofukuji sub-station



A View of the Track.

the normal daily routine is for the first machine to be started by the master time switch at 5 a.m., and to shut down at midnight. The rush hours on this section of the line occur morning and evening, with the result that the second machine in this sub-station comes into operation at about 7 a.m. due to overload, and shuts down at 9.30 a.m. due to underload. The same cycle occurs again at 4.30 p.m. and 9 p.m.

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## THE E.M.B. AIR-BRAKE SYSTEM.

In tramway practice the use of heavy cars running at high speeds on congested roads makes the provision of suitable braking equipment imperative. While brakes must be capable of gradual application for coasting and service stops, they must be sufficiently powerful to bring the car quickly to a standstill in emergency. Competition from motor omnibuses requires that service stops should be made in the least possible time, and stopping and re-starting of the cars must, therefore, be effected more quickly than hitherto. The constant demands on the driver's attention by the large volume of traffic require maximum simplicity in manipulation of the controls of the car so that the motorman may concentrate on the road in front of him.

To cope successfully with these exacting conditions a system of air-braking, the result of a long series of experiments, has been developed by the Electro-Mechanical Brake Co., Ltd., of West Bromwich, and this company claim that they can now supply brakes suitable for any car under all conditions of service. The underlying principles of the system, as set out by the makers, are :—

(1) That the air wheel-brakes are used for service stops under good rail conditions, and that the air track-brakes are used for service stops under bad rail conditions and for coasting on steep hills. The advantages of this arrangement are :—

(*a*) That the service wear is confined to the inexpensive cast-iron brake shoes and the wheel tyre.

(*b*) That braking on the wheel tyre eliminates the development of corrugations on the wheel treads due to track corrugation.

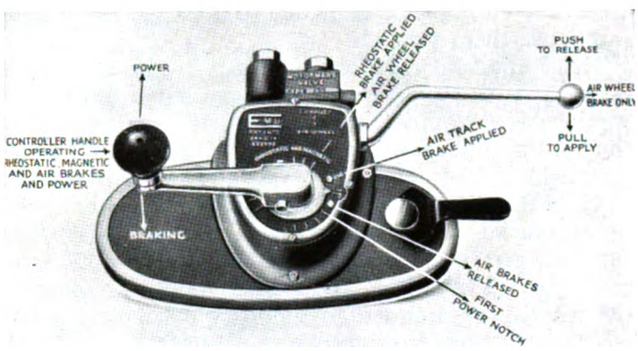
(*c*) That excessive wear of the track at stopping places, which must occur if track-brakes only are used for service stops, is avoided.

(2) That the air track-brake is the correct system for use in emergencies, because the rheostatic and magnetic brakes can be safely added to the air track-brake to give the absolute maximum safe retarding force.

(3) That to make the emergency brakes safe against wheel skidding should an emergency occur when the air wheel-brake is in use, a release valve for the air wheel-brake is brought into operation at the first rheostatic brake notch, so that the rising rheostatic load on the wheels will not overload them and cause skidding.

### Operation of the Interlocked Control.

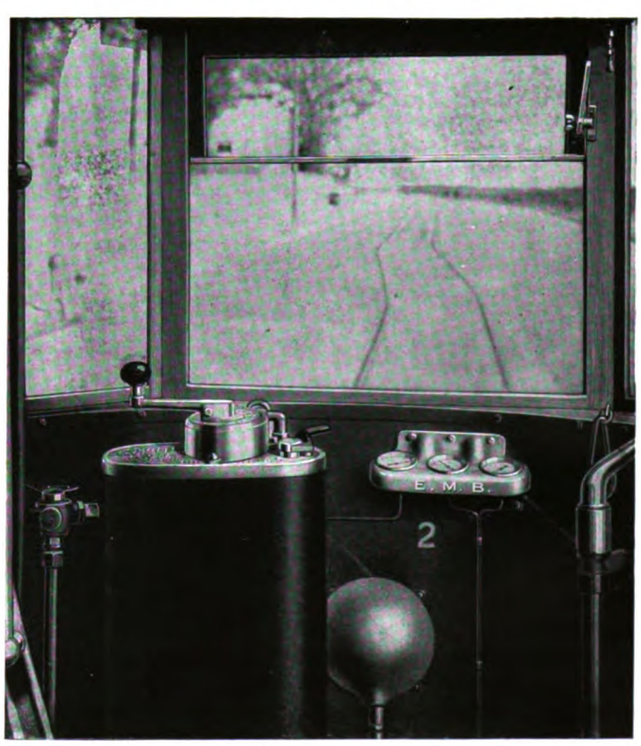
As is shown by an illustration, all the controls are situated on the top of the main controller so that the air brakes are fully interlocked with the rheostatic magnetic brakes and with the power. A separate handle operates the air wheel-brake, while the main controller handle operates the air track-brake. When a service stop is to be made the driver brings the main controller handle to the off position with his left hand and pulls the air wheel-brake operating handle towards him with his right hand. This allows air under pressure to pass to the wheel-brake cylinder and as the handle has a finger-light action the finest graduations of braking can be obtained up to the maximum adhesion of the wheel. The brake-handle, when released, springs back to the neutral position, but the braking effort is maintained at whatever pressure has been built up. The brake is exhausted by pushing the lever away from the driver. This air-brake handle is interlocked with the power-handle so that after a check in traffic or a service stop the air brake is automatically exhausted just before the main controller handle reaches the first power notch. In order to avoid waste of power in driving against the air brake a quick-release valve, which is fitted close to the brake cylinder, completely exhausts the cylinder and brings off the brake in less than one second. This quick exhaust




Interlocked Control System.

permits the driver to accelerate rapidly from service stops to the maximum speed of which the motors are capable.

To effect an emergency stop the driver swings the controller handle to the "off" position and the emergency brake is brought into operation by a further




Air Brakes for Wheels and Track.

motion of this handle in the same direction. With the E.M.B. arrangement the air track-brake position is midway between the "off" position and the first rheostatic braking notch. Should the effect of the 80 lb. maximum air pressure be insufficient for the emergency, further movement in the same direction will, in addition, bring the rheostatic and magnetic brakes into action.

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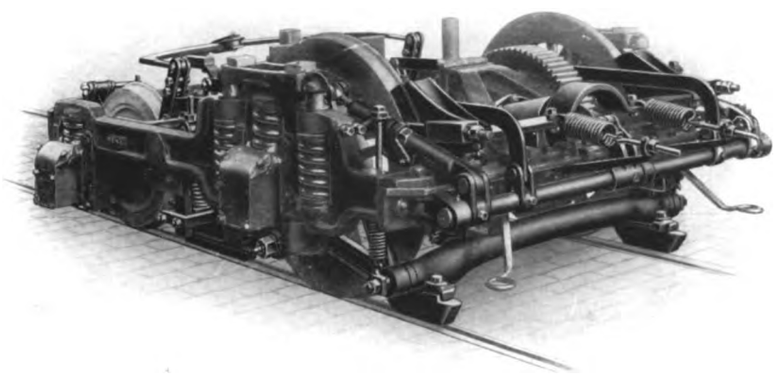
It sometimes happens that an emergency arises when the driver is using his service air wheel-brake, and it would be a serious defect in the system if sudden application of the emergency brake locked the wheels, because the powerful rheostatic and magnetic brakes are only effective so long as the wheels are turning and driving the motors. In the E.M.B. system, an interlocked release valve, located at the first rheostatic braking notch, ensures that the whole of the air is released from the wheel-brake system before the rheostatic current has had time to overload the wheels and cause them to skid.

This important interlocking between the air wheel-brake and the rheostatic brake was first fitted to the special car "Poppy" which was put into service on the Metropolitan Electric Tramways early in 1929, and described in THE TRAMWAY AND RAILWAY WORLD of April of that year. The brakes were thoroughly tested by an official of the Ministry of Transport before this car was put into service. Repeated attempts were made to skid the wheels by putting full air pressure on the wheel-brakes and then suddenly applying the full emergency rheostatic and magnetic brakes. In every case the air was released so quickly that skidding did not take place. The actual effort needed to operate the brakes on the part of the driver is so slight that he is comparatively fresh at the end of the day's work; a fact which makes for safety.



View of Air Brakes at the Driving end.

The illustration above shows the Burnley type of truck supplied to the Birmingham Corporation and also the E.M.B. air-brakes at the driving and pony-wheel ends of the truck. The air-braking equipment consists of a pair of cast-iron track shoes immediately in front of the driving wheels, a pair of magnetic track shoes between the wheels (the shoes only being lowered) and a pair of wheel shoes on the pony and driving wheels. This combination affords a smooth and powerful air-brake in ordinary service conditions, with an ample reserve of electro-magnetic braking power, available by moving the control handle round another notch or two.

### AIR COMPRESSOR.

The air compressor is of the motor-driven direct-coupled type. Its design is based on advanced automobile practice, and the compressor is capable of high speeds over long periods without maintenance troubles. Both the cylinder and valve chamber are well ribbed to disperse the heat generated. That the cooling arrangements are ample may be judged from the fact that a machine has been run continuously for four days at 1,600 R.P.M. without any decrease in efficiency. In order to prevent distortion when working at high temperatures, the valve discs and seats are all made of heat-resisting steel The crankshaft, which is of high tensile steel, runs on three large ball bearings, one of which definitely locates the shaft endways.

The oil pump is similar in design to that used for many years on high-speed steam engines and contains no ball valves. It is driven from an eccentric at the end of the crankshaft, the pump itself being contained in the end casing of the compressor where it is easily accessible. The motor is fitted with inter-poles, which ensure excellent commutation, and the armature is carried upon the free extension of the compressor shaft. Special provisions have been made to secure silence of the compressor in operation.

Two sizes of compressor are made—a two-cylinder, as shown in an illustration, and a four-cylinder of similar type. Both compressors are designed to run at 1,000 R.P.M., but where an exceptionally quiet machine of medium capacity is required a special motor can be fitted to the four-cylinder machine to run at 500 R.P.M.

### BRAKE CYLINDERS.

Owing to their location under the tramcar, brake cylinders have to work under very bad conditions. A certain amount of grit inevitably finds its way into the cylinder, and the E.M.B. patent non-leak loose head piston has been developed to overcome the trouble which frequently arises from this cause when leather cup-rings are used. The sealing medium consists of a V-shaped Dexine ring which, while moving freely at low pressures, utilises the air pressure on the loose piston head to seal the piston effectively at the braking pressures, so that there is no danger of the pressure leaking off when the driver is coasting.

### AUTOMATIC GOVERNOR.

The E.M.B. governor, which is of patented design, is an important link in the system, and special attention has been given to the problem of reducing burning of the switch contacts to a minimum. At the instant of break a jet of air is directed on to each contact, effectively blowing out the arc which would otherwise persist. The governor is capable of switching the compressor in or out of action within a range of 15 lb. per square in. anywhere between 40 and 100 lb. per square in. pressure.

### QUICK RELEASE VALVE.

The quick-release valve is placed in the train pipe of the air-brake system, near to the brake cylinder, and works in conjunction with the motorman's valve. It accentuates all releases of the brake as, by its means, the air in the brake cylinders can be exhausted in one-fifth of the ordinary time. When the air-brake is applied the pressure air enters the valve, forces the loose piston valve on to the exhaust port, and then passes by way of the slots cut in the valve chamber to the brake cylinder. So long as the brake is applied the piston is held down on the valve seat by air pressure and will not operate. If the brake is released slightly

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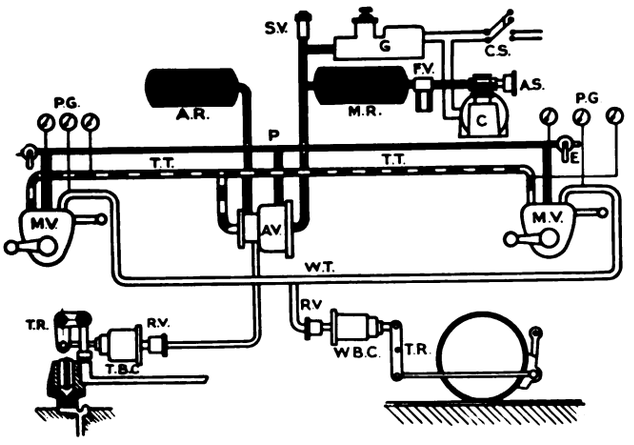
the valve remains seated, but a quick exhaust of air from the motorman's valve causes the piston to lift and release the brake in less than one second. As soon as the handle of the motorman's valve is moved to the "off" or "brake on" positions the piston reseats.

The E.M.B. patent safety valve is shown in the accompanying diagram. From this it will be seen that as soon as the pressure rises above the predetermined figure to which the valve is adjusted, the piston lifts and allows the air pressure to act on a piston having a considerably larger area. This quickly lifts the piston clear of the exhaust ports. When the air pressure drops to a safe value the piston gradually sinks to the original position until the two holes in the valve at the top of the safety valve are covered, causing the piston to fall by a rapid rise of pressure in the chamber above.

### Anti-Freezing Valve.

To eliminate the freezing of condensed mixtures in the valves and pipe system of tramcar air brakes the E.M.B. anti-freezing valve has been developed and tested under most severe conditions. The valve operates by exhaling vaporised alcohol into the air delivery pipe from the compressor. The result is that all air present in the brake system contains a certain proportion of vaporised alcohol, and, therefore, any condensed moisture present in the pipe contains a small proportion of liquid alcohol, which effectively prevents any freezing. It is recommended that the valves be filled with alcohol at the beginning of November and that they be inspected each week to ensure that the level of alcohol is maintained.

To make the modern tramcar as safe as is humanly possible, a safety device known as the emergency valve is fitted at both ends of the car. The object of this device is that if anything happens to prevent the

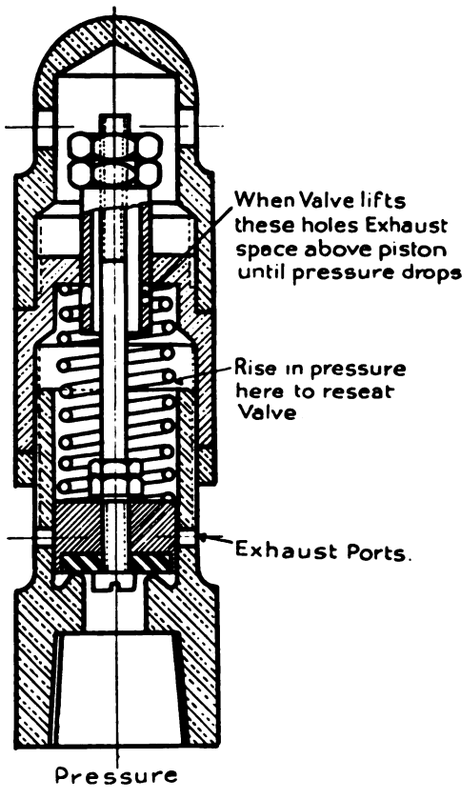



Diagrammatic Arrangement of Dual Air Braking Equipment.

normal operation of the air brakes the car may be brought to a standstill by either the driver or conductor operating the emergency valve. To provide for such emergency there is an auxiliary reservoir kept always at maximum pressure, irrespective of the pressure in the main reservoir. It is the pressure in this auxiliary reservoir that is instantly applied to the track-brake cylinder when the emergency valve is opened. The air reservoirs, which are made of high-grade mild steel, are tested up to a pressure of 300 lb. to the square in. and are subsequently treated with special bituminous paint to prevent rusting due to moisture deposited from the compressed air.

The shoes for the track-brake may be either plain or magnetic. The plain shoes are made of special cast-iron having a high co-efficient of friction. Magnetic shoes are fitted with strong electro-magnets so that they may be energised to increase their co-efficient of friction if a greater retarding force is required than can be obtained by using them as plain shoes. This method of first lowering the magnetic shoes into contact with the rail before they are energised provides a much smoother brake than when the magnets are arranged to pull down on the rail without any preliminary lowering.

The pressure gauge panel is fixed close to the main controller and carries three pressure gauges which register the air pressure in: (1) the main air reservoir;




The patent Safety Valve.

(2) the wheel-brake cylinder; and (3) the track-brake cylinder, thus giving the motorman knowledge of what air pressures are being used and those still available.

The makers recognise that replacements become necessary from time to time and to assist in making quick renewals they have available for dispatch, at short notice, a large stock of air-brake parts machined to accurate limits in order to ensure interchangeability.

## ELECTRIC BATTERY TESTS IN DUBLIN.

Towards the end of July the Minister of Industry and Commerce of the Irish Free State carried out tests with the new storage battery invented by Dr. J. Drumm, the Government being financially interested in the invention. During the tests the battery hauled a train at a speed of 35 M.P.H., and the Minister issued a statement that the tests had been eminently satisfactory. The Minister also mentioned that the new battery is a low resistance alkaline battery of robust construction, that it has 50 per cent. higher voltage than existing alkaline batteries, that its current efficiency is 75 per cent. under practical conditions of operation, that it can be charged in periods from eight minutes to an hour, and that acceleration rates of the order of one mile per hour per second and maximum speeds of 50 to 60 M.P.H. may be maintained.

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## DIESEL ELECTRIC RAIL TRACTION.

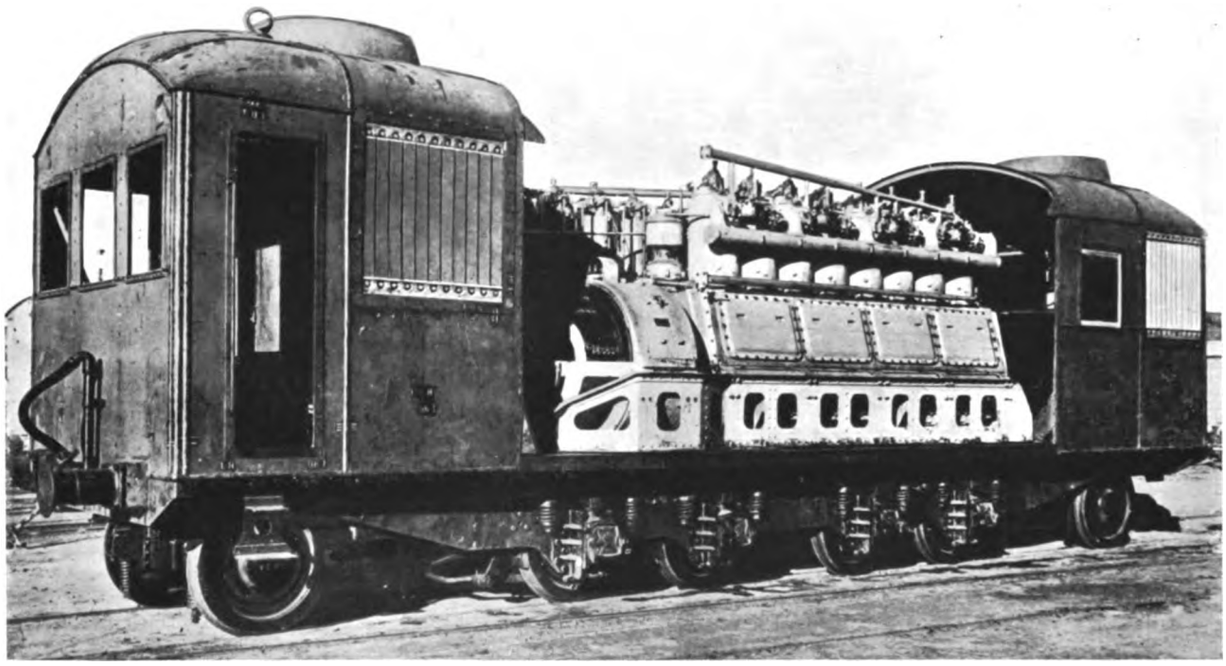
ADVANTAGES OF THE MOBILE POWER UNIT.

Railway electrification is so costly that only where there is a considerable density of service is it economically justified. The improvement of the Diesel engine which will generate electrical power on the train has, however, made an electric service possible where rapid acceleration is required, without the cost involved in the provision of power houses, transmission, sub-stations, rail or overhead conductors, and other equipment.

Sir W. G. Armstrong Whitworth & Co. (Engineers), Ltd., have just issued a brochure dealing with the economics of Diesel electric traction and illustrated by examples of units in satisfactory operation. The company manufacture Diesel electric locomotives and rail cars in technical collaboration with and under licence from Sulzer Brothers, of Winterthur, Switzerland.

of the train unit. The engine is stopped when the train coasts or runs into a station, and is started electrically. This secures economy in fuel and reduction of wear and tear, and there is no noise or vibration when the train is standing in the station. The train attendants and maintenance staff need be no different from those required for ordinary electric operation. The generating sets can be carried in the motor coaches or housed in a mobile power house supplying power to motors distributed on the bogies of the train.

It is claimed that the latest Diesel electric locomotive competes with the steam locomotive wherever the cost of oil fuel is not excessive compared with coal. It also competes with ordinary electric main line traction because, while retaining the advantages of the electric locomotive, it is independent of costly electrified track and sub-stations, and gives the operating flexibility of the steam locomotive. One Diesel, it is claimed, can replace two or three steam locomotives and can work continuously for several days without attention other than oiling. The power equipment is



A 1,200 B.H.P. Diesel Electric Mobile Power House built for the Buenos Ayres Great Southern Railway.

As the Diesel engine and generator is carried on the train, electric traction can be started at small cost and extended as capital becomes available and services demand, while for opening new suburban lines or operating lightly-used lines it has definite advantages. At present, it is claimed, such an engine can compete with a central power station delivering current to the sub-station terminals at .45d. per unit on a service with only five minutes interval between trains each way under the severe London suburban conditions.

The Diesel service is, of course, independent of central station and transmission breakdowns, as a breakdown affects only the train on which it occurs. For suburban traffic the high acceleration and schedule speed and the short terminal lie over of the electric train are retained. There is no shunting of locomotives at terminals. Train units can be run in multiple under the control of one driver with the same ease and reliability as with the electric multiple-unit train, the electric controls being similar and placed at both ends

practically fool-proof and its working and condition are not nearly so dependent upon the skill of the driver as the steam locomotive. Longer runs are possible, running shed accommodation can be more widely spaced, and at the end of the day the machine requires only routine examination of the running gear and oiling and cleaning for the next trip. It is always available for service at a moment's notice, there is no consumption of fuel when "standing by," and fuel for twenty-four hours' service can be pumped into the tank in a few minutes; it can be operated from either end, so that the turn-table is dispensed with.

The 1,500 B.H.P. and 750 B.H.P. Diesel locomotives weigh respectively 135 tons and 74 tons—approximately 200 lb. per engine B.H.P. The 1,500 H.P. locomotive has a tractive force up to 8.5 miles per hour of 46,000 lb. and a maximum speed of 37.3 miles per hour. The 750 H.P. Diesel has a tractive force up to four miles per hour of 36,500 lb. and a maximum speed of 37.3 M.P.H. With the elimination of the tender, the

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locomotive becomes one unit and all the weight becomes available for adhesion if necessary. This gives the choice of designing for a higher tractive force with the same total weight or for the same tractive force with greatly reduced weight.

The fuel oil consumption necessary to generate a unit of electricity on a Diesel electric locomotive is established, so that reliable estimates can be made of the fuel consumption under various conditions of working. These figures show that normally a Diesel uses about one-twelfth to one-eighth of the total weight of fuel per gross-ton mile used by coal-burning steam locomotives. Taking the cost at the locomotive of Diesel fuel per ton as 85s. and of locomotive coal as 20s., the cost of Diesel fuel per gross-ton mile is 0.35 to 0.53 of that of the steam locomotive. At this rate it is calculated that there would be a total saving on fuel alone of £7,000,000 to £9,000,000 per annum on the railways of Great Britain. Besides the saving on fuel, records show that maintenance costs per train-mile are very considerably less than with steam working, and there is economy in labour costs. It is claimed also that the capital charges are little different from steam, as one Diesel engine unit will generally replace at least two, and frequently more, steam locomotives, and the depreciation is not at such a high rate.

The competition from road transport has drawn attention to electric rail cars for lines which are lightly used. It is claimed that the 250 H.P. car can be run in Great Britain from 3d. to 5d. less per train mile than existing steam rail cars of latest type with 100 H.P. boilers, taking coal at 16s. and Diesel oil at 90s. per ton. This saving would more than justify the extra first cost of the Diesel car.

Apart from their other advantages in being able to cope with extra traffic and to maintain higher schedule speeds, besides their greater availability, these cars, hauling several trailers, have reduced the total operating cost per train-mile to nearly one-third that of steam locomotives.

The engines made from Armstrong-Sulzer design are high-speed four-cycle, with six or more cylinders in line. This design allows the masses to be completely balanced, thus giving freedom from vibration. They work on the airless injection principle, having no air compressors. The pre-combustion chamber method of ignition is adopted so that a low-pressure fuel pump and simple injection valve can be used. This system ensures good combustion at varying loads and ease of starting.

There are automatic safety devices for cutting off current and applying the brakes if anything happens to the driver. The engine is started by supplying the generator as a motor from a battery of accumulators, and is stopped when power is not required as when coasting or in stations. All the auxiliaries can be worked electrically. Reduced engine speeds are arranged to permit efficient working when low power is required at the rails.

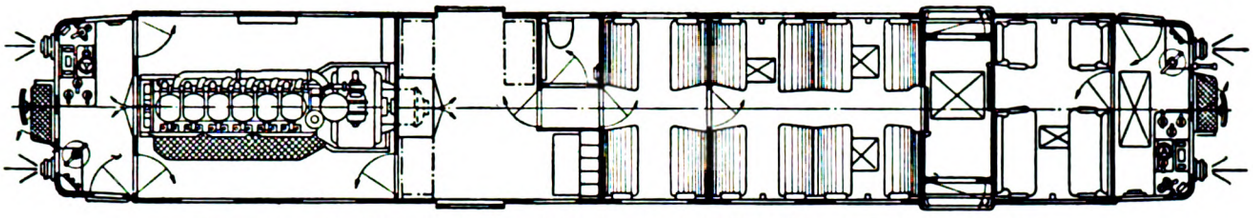
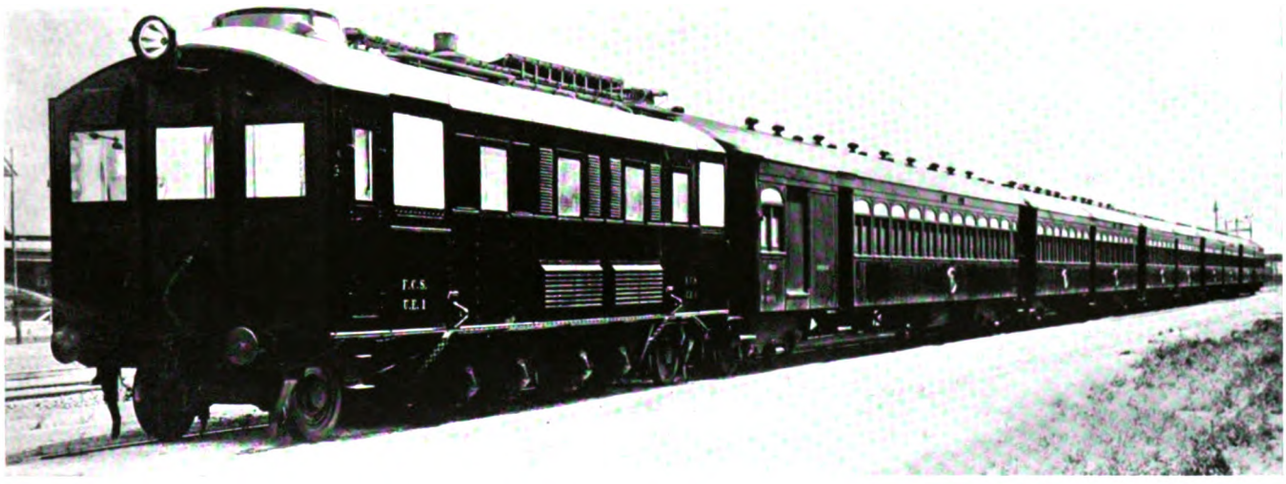


Diagram of a Diesel Electric Rail Car with 250 B.H.P. 6-cylinder Engine.



1,200 B.H.P. Diesel Electric Train on the Buenos Ayres Great Southern Railway. Power is Supplied to Motors on the Coaches by two 600 B.H.P. Generating Sets.

It may be mentioned that Sulzer Brothers have over 3,500,000 H.P. of Diesel engines in service. Their first engines were installed in sea-going ships, many having been built by Armstrong Whitworth. Following this experience, in 1912 they started the development of a suitable type for rail traction and proceeded along the lines of producing a high-speed engine, light enough to be carried in a rail vehicle, yet retaining the strength and rigidity of construction comparable with that obtaining in marine service. This development is in contrast to the method of adapting the light aircraft or motor car engine to railway conditions.

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The Editor will consider contributions offered for publication in THE TRAMWAY AND RAILWAY WORLD (including the Omnibus and Coach Section) by those conversant with the subjects that come within the scope of this journal. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, AUGUST 14, 1930.

**The New Act and Tramways.**

The Road Traffic Act, with some of the features of which we deal in our Omnibus and Coach Section, expressly excludes from its ambit everything connected with tramways and with the trolley omnibus system. These undertakings are statutory and so are otherwise provided for. But there is one point in the Act which may have an important bearing on the revenue, both of tramways and of trolley omnibus lines. Under the Act the arbitrary and sometimes inconsiderate powers of local authorities to grant licences to all and sundry for the running of omnibuses is swept away. All such powers will be vested in area traffic commissioners, who are impartial, who will consider general public needs, and whose jurisdiction extends over wide areas. It is expressly laid down in the Act that the commissioners, in considering applications for road service licences (which are quite apart from vehicle licences) shall have regard (among other things) to the extent to which the needs of the proposed routes are already adequately served, and the needs of the area in relation to traffic, including the elimination of unnecessary services and the co-ordination of all forms of passenger transport, including transport by rail. Here then ought to come some opportunity for the tramway undertaking, whether municipal or Company, which is struggling with adversity caused by unlimited omnibus competition allowed by local omnibus licensing authorities who cannot see beyond their noses. All that will be swept away. If the tramway authority can show itself to be efficient and gives sufficient services for its locality, the omnibus there should disappear. Of course, it may be retained for long-distance work. The implications in this long and complicated Act are numerous, and it will not be surprising if, within a year or two, the Law Courts become busy in its interpretation.

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**Restriction not Prohibition.**

Tramway and omnibus operators in this country will be surprised to learn that an authoritative trade journal in the United States opens an editorial article by asserting that in London omnibuses are prohibited from running along tramway routes. Searching about for an explanation of this astonishing statement one recalled the paper by Mr. Shave, of the London General Omnibus Company, which was presented to the recent annual congress at San Francisco of the American Electric Railway Association. This paper (abstracts from which appear elsewhere in this issue) dealt largely with the London omnibus system, and expressed the view that the London tramways would be in a very bad way if it were not for the restriction on omnibus services under the provisions of the London Traffic Act. Apparently the writer in the American journal assumed that restriction means the same thing as prohibition. With the restriction of omnibus services not only on tramway routes, but on all busy thoroughfares in London, we are all familiar. But for that restriction, London streets would now be impassable. Omnibuses were multiplying like flies till the London Traffic Act came and said "no more." Everyone but omnibus proprietors and would-be omnibus proprietors is the better for that. The Commissioner of Metropolitan Police, who is the omnibus licensing authority, had no power to refuse licences to vehicles which conformed to his requirements as to construction and dimensions. Things are different now and the tramways have their chance in fair competition. But how, by any stretch of the imagination, could it be supposed that in London omnibuses were

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prohibited on tramway routes? Even now they are far and away more numerous than tramcars. If Parliament had tried to prohibit omnibuses on tramway routes the outcry would have reached the whole transport world. It is true that during the slack hours of the day the omnibuses on tramway routes are quite unnecessary except for the fact that they penetrate beyond the tramway termini to regions where there are no other means of transport. But in the rush hours both tramcars and omnibuses are necessary, full loading in both cases being the rule.

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**Inviting Public Interest.**

It is to be feared that neither the public nor the general body of local traders in this country know as much about public transport undertakings as they might. The blame for this lack of knowledge and interest is as much that of the public, which leaves everything in the hands of the powers that be, as of the officials and elected representatives who have not visualised the value of closer acquaintance in securing the confidence and co-operation of the people in their capacity as both rate and fare payers. Councillor Billings, of Leicester, evidently has the root of the idea, as he has invited the local trading bodies in their corporate capacity to visit the principal municipal undertakings, including the tramway depot. The idea could be extended without impinging on the duties of officials. In every town there are societies of people who exist for social intercourse and mental enlightenment, congeries of intelligent citizens who would be most pleased to visit these undertakings and get a better knowledge of their working. When invited in convenient-sized parties the occasions can also be made pleasant experiences. A run in a tramcar or an omnibus to some suitable spot in the locality, an explanation of the operating work, a visit to a power-house, a garage, or a tramway depot, can be made profitable to all concerned in the creation of harmonious relations and appreciation of the skill and knowledge of those responsible for such undertakings. Closer acquaintance, indeed, brings about that greater understanding which comprehends when things go wrong and tolerates an occasional mistake or even an unavoidable breakdown.

**A Tramway-Omnibus Comparison.**

In view of the tendency to substitute motor omnibus services for tramways, comparative results are of great interest, especially where the two systems are in operation under similar conditions. On another page is given an interesting table which compares tramway and omnibus operation in Manchester, the figures being taken from the recently-issued report of the Transport Committee. The Manchester transport system is successful from every point of view. The net surplus for the year ended March last was £90,022, and for the previous year it was £102,813. At the end of March the Corporation had 926 tramcars and 190 omnibuses, and although the route mileage of the omnibuses increased from 172 to 210, while that of the tramways remained practically the same, the increase in the number of passengers carried by the cars was only slightly behind that of the omnibuses, the actual increases being 3,471,425 by car and 4,217,821 by omnibus. Operating expenses per car mile are, of course, much higher than those of the omnibus mile, for reasons which are well known, but the omnibus cost increased from 10.480d. in 1929 to 11.166d. in the past year, compared with the tramways' 14.678d. The average distance per penny that the passenger travelled on the cars was 1.574 miles, and on the omnibuses .898 miles; the average fare per mile was .635d. for the cars and 1.113d. on the omnibuses. It is also significant that the traffic revenue per car mile last year was 17.826d., while that of the omnibuses was only 13.675d.; the percentage of working expenses to receipts was the same, namely, 82 per cent., the omnibus percentage having increased from 78 in the previous year. Again, the average fare paid per passenger was 1.34d. on the cars and 2.66d. on the omnibuses, and the average number of passengers per car mile was 13.33 and 5.13 per omnibus mile. On these figures the advantage to the public seems to be in the tramcars, which, of course, still constitute the greater means of transport in Manchester, although certain routes have been scrapped and omnibuses substituted. On the whole, the position at Manchester appears to endorse the opinion that the general replacing of tramways by omnibuses would entail higher fares.

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## SOUTHEND'S NEW TROLLEYBUSES.

The English Electric Co., Ltd., has recently delivered two trolleybuses, which are illustrated below, to the Southend Corporation Transport Department. The vehicles have been constructed to the general design and specification of the general manager, Mr. Ronald A. Fearnley, who has made special endeavours to combine the comfort, convenience and appearance of the modern motor omnibus with the advantage of the trolleybus. The chassis has been specially built to give low loading and a low rear platform. With this object in view 36-in. by 8-in. giant pneumatic tyres have been used. The rear bogie embodies the "Thornycroft" method of mounting and has also a third differential incorporated in the axle. The steering is of the cam and roller pattern giving ease of operation even with a large vehicle.

The hand brake operates on the four rear wheels. The foot pedal, on first being depressed, operates the rheostatic brake and on further depression brings into operation the Westinghouse air brake which operates on all six wheels. An interesting innovation is the fitting of a valve on the rear platform for emergency operation by the conductor.

The motor and the controller are of the English Electric Company's latest design and manufacture.

Southend Corporation's New Trolleybus.

The motor, which is mounted amidships, is of the twin armature type developing 100 H.P. on the one-hour rating. The controller is of the contactor type, the master controller being foot operated.

The body seats 56 passengers, 26 in the lower and 30 in the upper saloon. The wide platform gives easy access to the lower saloon and an extra front exit door is provided for rush purposes during the holidays. The staircase to the upper saloon is particularly wide, and as will be seen in one of the photographs, has a landing in the centre. In the lower saloon there are four drop windows, and in the upper saloon six, while a sliding window is provided at the rear end.

The seating is particularly comfortable, moquette and leather being utilised in the lower saloon and green leather in the upper. The seats are mounted on pressed steel legs and backs. The interior finish of the cars is in light oak with white ceilings.

The lighting is provided by nine 40-watt opal lamps with chromium-plated reflectors in the lower saloon, and ten similar lamps with white enamel reflectors in the upper saloon. Another interesting feature is the provision of emergency lighting by means of "Alklum" batteries, which also supply current for operating the

Front View of Southend Trolleybus.

electric wind-screen wiper and horn. The batteries are charged by means of a triple charging arrangement from one of the lighting circuits.

The trolley bases are of Messrs. Estler Brothers' latest pattern and are mounted throughout on anti-friction bearings, giving extremely free operation.

As will be seen from the photographs the general outside finish of the cars is very attractive. The painting, which is of the Southend Corporation's new pattern adopted last year, consists of a light green with ivory panels in between and lined out in gold and black lines.

## TROLLEYBUS PROPOSALS.

Hull Corporation Parliamentary Committee has adopted the recommendation of the Tramways Committee to seek powers to run trolleybuses.

St. Helens (Trolley Vehicles) Provisional Order Act received the Royal Assent on August 1. It empowers the Corporation to construct and maintain an extension of the present system for a distance of 2½ miles beyond the borough boundary.

Leicester Corporation is given authority under the Bill which has now been given the Royal Assent to introduce the trolleybus system. Alderman G. Banton (chairman of the Tramways Committee) is strongly in favour of the system on the Melbourne road route. As the tracks in Leicester wear out, advantage will probably be taken to equip some of the routes with the trolleybus system, but there is no intention of scrapping the tramways as a whole.

Wolverhampton Corporation, whose trolleybus routes have been an outstanding success, were granted a Provisional Order by the Ministry of Transport who authorised the use of trolleybuses on sixteen routes totalling about 13½ miles, mostly in the borough and partly in the urban districts of Tettenhall and Wednesfield. The proposed routes are extensions of existing sections.

The South Lancashire Tramways Company on July 30 substituted double deck trolleybuses for tramcars on seven miles of their route from Atherton to Ashton by way of Hindley. Later the trolleybuses will be used throughout their routes. The South Lancashire Tramways form part of the undertaking of the Lancashire United Transport and Power Company. Their tramcars operate over 37 miles of the industrial area that extends from Manchester through Salford to Bolton, thence to Atherton, Hindley, Ashton-in-Makerfield and Lowton St. Mary's.

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# ACCUMULATOR DRIVEN RAIL VEHICLES IN EUROPE.*

*By* M. Le Commendatore P Lo. BALBO,

***Manager of the Piedmont-Caluzzo Tramway Company.***

The problem of electric traction by accumulators, which has long suffered unmerited discredit, has, during the past few years, again engaged the attention of engineers. The interest with which the question has once more been taken up and the fact that several railways and tramways have placed orders for the newer models of these vehicles are very significant signs.

Upon examination of the statistics of construction and operation of this type of vehicle, it is seen that during the past four or five years there has been an increasing tendency in their favour. It is solely due to their adoption that several light railways and tramways have been able to retain the patronage of passengers which they would otherwise have lost. The question of cost (not only of installation, but also of maintenance and amortisation) can be regarded as having been satisfactorily resolved in view of the results obtained with the vehicles already in service.

In order properly to appreciate the question of electric traction on rails by means of accumulators, it is interesting to analyse briefly results of the various experiments made in different countries.

The first application of accumulators to tramway traction was made in Brussels in 1887. Accumulators in portable cases, housed under the seats of the car, furnished current to an electric motor beneath the floor of the vehicle. The motor transmitted motion to the wheels through the medium of suitable gearing. The track was about one mile in length, with an incline of about 1 in 20.

The generating station where the accumulators were charged was equipped with two 60 H.P. steam engines and four dynamos. The accumulators were of open type and each battery was composed of 27 cells each containing 15 plates, seven positive and eight negative. The cells were connected in series and each battery weighed over 800 lbs. There were four batteries per car. The controller, which was provided with a reversing switch, permitted the vehicle to be driven on two, three or all four batteries in series. Four fully-charged batteries provided sufficient power to operate a car during half a day, so that the 32 batteries which one of the generating sets could charge in eight hours, represented the daily power supply of four vehicles. The weight of each car, which carried 16 passengers seated and 16 standing, was approximately 7½ tons when fully laden.

Results of this early experiment were not very happy, partly because of the care demanded by the battery but, above all, by reason of the gradient. Moreover, the odour from the battery was extremely unpleasant.

In the year 1900 the Belgian railways experimented in the construction of five accumulator driven electric vehicles. Each car, the length of which was 52 ft., could accommodate 30 second class and 36 third class passengers, in addition to which 12 standing passengers could be accommodated on the platforms. When fully loaded these vehicles weighed 51½ tons, of which 12 tons was accounted for by the batteries.

The accumulators were accommodated in four cupboards, two at either end of the vehicle, which were accessible from outside. Each of the two bogie trucks was provided with a motor taking up to 150 amperes of current at 500 volts. The vehicles had a possible range, on one charge, of 55/60 miles, with a stop at every 3 miles, at an average speed of 18 miles per hour.

While this experiment was being carried out in Belgium, similar progress was being made in Italy and in France. In Italy trials of accumulator driven vehicles were being made on the Milano-Monza line and on the line between Bologna-Poggio and Rusco-San Felice. At the same time, on the Adriatic section of another of the Italian Railways, experiments were being carried out with four coupled vehicles equipped with two motors deriving current from one battery of 94 cells. The battery had a capacity of 140-ampere hours and was recharged in two hours only.

After a brief period, all these experiments were, for numerous reasons, suspended.

It must be recalled that at that time the technique in regard to accumulator construction was less advanced than it is to-day. To mention only one detail, the average life of the accumulator plates in those days was equal to about 6,000 running miles for the positive and 12,000 miles for the negative plates. To-day, it is possible to obtain a life equal to 62,000 running miles for the positive plates and 125,000 running miles for the negative plates.

Apart from the potential life of the batteries, multiple control for the motors was unknown and it was not then possible as it is to-day to couple two motor vehicles and several trailers without any appreciable increase in running costs.

In France, in the year 1900, the Nord Railway experimented with motor vehicles provided with batteries of 132 25-plate cells, while in Paris trials were made with 35 vehicles on the Madeleine-Levallois line, on which there are gradients of 1 in 25.

At about the same period 105 vehicles, each of which accomplished between 20,000 and 30,000 miles running, remained in service in Hanover for three years. It is of interest that the maintenance of these vehicles was carried out by only 25 men.

Experiments were also carried out in Hungary and in Dresden, where there were 40 vehicles in service. These latter vehicles, however, left much to be desired owing to variations in the capacity of the cells comprising a battery.

All the trials of urban traction with accumulator vehicles at Milan, Ostend, Turin, La Haye and Lancaster were carried out in empirical fashion and at a time when the technique of accumulator maintenance had not received the careful study which the subject demanded.

In consequence, the system was abandoned, but in an altogether too radical manner in the sense that the technical world turned aside from the application of accumulators without regard to the fact that the vehicles experimented with had been worked under conditions altogether too difficult, since the routes chosen did not present the specific conditions necessary for the application of this system of traction.

The notorious failure of the accumulator driven vehicles in Turin and Rome was due to the mixed type of traction employed. In both these cases the vehicles ran partly on lines where they collected current from overhead wires by means of trolleys and partly on lines where they depended upon the current provided by the batteries. Theoretically the batteries were charged during the time the cars were functioning by means of the trolleys, although the main charging was done during the night. But the inevitable variations in pressure in the overhead lines frequently gave rise to excessive over- or under-charging of the batteries. Moreover, the disposition of the batteries on the vehicles, both at Turin and at Rome was of a lamentable nature both from the point of view of inspection and maintenance, the importance of these latter factors having been entirely underestimated.

Other causes which aggravated the difficulties experienced were faulty insulation of the batteries, incomplete ventilation, damage to car bodies by spilled acid, incommoding of passengers by acid fumes, and the steep inclines which occasioned excessive discharge of the batteries. With such conditions failure was inevitable, and the accumulators, ardently fought for, were abandoned.

After many years, experiments carried out in Saxony gave the first good results. The vehicles put into service there are composed of two equal parts, each carried on two axles, connected by two strong couplings. The vehicle is entered by a central platform, similar to those at either end. The distance between axles in each of the two halves of the vehicle is 13 ft. and the unladen weight of the whole is 43 tons. The capacity of the battery is 430 ampere-hours, and it is composed of 184 double cells in airtight ebonite cases placed beneath the seats. There is accommodation for 98 passengers and the car is driven by four 4-pole motors connected in series. The driving wheels are 39 ins. in diameter.

*Abstract of a paper presented at the Congress of the International Tramways Union at Warsaw on June 30th, 1930.

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Experiments made in Berlin have been directed to the employment of a lighter type of accumulator, with lead grids instead of the massive type of plates hitherto used.

After exhaustive trials, accumulator vehicles were adopted on the old Berlin-Charlottenburg tramways and on the local metre-gauge railway between Ludwigshafen and Darmstadt. On the latter line, accumulator vehicles were substituted for the workmen's trains which had previously been hauled by twenty-ton locomotives The service functioned without any irregularity attributable to the batteries and the new means of traction conquered the favour of the public.

Other vehicles were soon put into service on the normal gauge Würtemburg State line from Stuttgart to Plochingen, with a length of 14 miles and with five intermediate stations. The cars, which are equipped with electric brakes, are carried upon two bogie trucks and are driven by two 35 H.P. motors.

In view of the good results obtained on the lines above referred to, the administration of the Bavarian Palatinat decided upon the construction of accumulator vehicles of considerable dimensions capable of hauling one or two ordinary railway coaches. After having electrified the 20 miles of line between Ludwigshafen and Neustadt, it was decided to electrify, by means of accumulator vehicles, the line from Ludwigshafen to Worms (14 miles) and the line Schifferstadt-Speyer-Germersheim-Landau-Aunweiler (44 miles).

The batteries of these vehicles are charged *in situ*. During the charging process the battery chambers are ventilated by means of ½ H.P. motors specially installed at the charging station. Charging is done in the interval between the arrival and departure of the trains at Ludwigshafen and at Neustadt, one charge being sufficient for the journey of 27 miles. Charging, at 200 amperes, 300 volts, is accomplished in a little under thirty minutes.

It has been found that maintenance of the motors presents greater difficulties than does the battery. Difficulties have also been experienced with the large cast-iron gear wheels on the axles of the vehicles. It is intended to replace these latter by cast steel wheels. The motors present the inconvenience that their speed, and consequently the vehicle speed, falls in proportion to the load. These difficulties, however, are being gradually overcome, and it is clear that a new and active current of opinion is manifesting itself in Germany in favour of electric accumulator traction.

Although experiments made in Italy, in 1911, on the line between Turin and Chieri gave very good results, the trials were of very short duration, and the application of the system was not continued. It is only since the year 1923 that there has been a renaissance in Italy, with excellent results. All the world agrees upon the advantages possessed by electrically-driven lorries over those dependent upon an internal-combustion motor. These advantages make preferable the use of electrically-driven vehicles in a country where benzine and other carburants are necessarily costly, and where the price of electricity is constantly falling owing to the utilisation of water power for its production. Moreover, in the large towns very favourable contract prices are quoted for supplies of current taken during night hours.

So far as the problem of maintenance of batteries is concerned, that is a problem which can now be considered as solved. It is now a general condition of contracts for the purchase of batteries that the manufacturers must, during a certain number of years, maintain the apparatus against a fixed annual payment—usually based upon the mileage covered by the vehicle in which the battery is installed.

Another form of agreement which is very popular is that under which the suppliers of the batteries undertake, for a modest payment, to periodically inspect the batteries in order to verify their condition, indicate possible sources of difficulty and to give advice and instruction to the staff concerned with battery maintenance in order to guarantee the proper and regular functioning of the battery.

Two types of battery are now principally employed for traction purposes, viz., the lead plate type with an acid electrolyte, and the iron-nickel plate type with an alkaline electrolyte.

The ideal accumulator for electric traction is one which embodies the four following qualities, viz., maximum capacity, maximum life, minimum weight, minimum size. Unhappily, despite incessant research and numberless experiments which are daily made, the traction accumulators at present constructed are still far from the ideal. When the perfect accumulator arrives there will be a revolution in electric traction, the results and importance of which it is almost impossible to visualise. Enormous strides have, however, been made by the "Tudor" and "Edison" type traction accumulators which are now used all over the world.

In certain special cases where service conditions are difficult or where a wide field of operation is contemplated and initial economies can be to some extent disregarded, the new "Ironclad" type of accumulator is preferable to the normal variety. This accumulator originated some years ago in America, where it was quickly taken up on a large scale.

In this accumulator, the positive plates consist of a series of small cylindrical electrodes assembled upon two transverse bars to which they are welded. Sulphuric acid forms the electrolyte. It is characteristic of these accumulators that during their whole existence there is no necessity for internal revision, washing out, changing of plates or separators. In normal traction service the life of this accumulator is equal to 600 to 700 complete cycles of discharge and recharge before falling below the 80 per cent. efficiency which the makers guarantee. There are in existence upon electric vehicles batteries of this type which have been in service from 5 to 6 years, and which have exceeded 1,000 complete cycles of charge and discharge without falling below the efficiency above indicated.

During the several years in which accumulator driven vehicles have been in service in Germany improvements in the rolling stock as well as in its operation have been continuous. Many of the vehicles in use have a range of action of 100 miles and, even when fully laden, attain speeds in excess of 40 miles per hour.

In Germany there are over 4,500 miles of track served by upwards of 4,000 accumulator driven vehicles. The mileage run by these vehicles, which was only 125,000 in 1907, had increased, in the year 1929, to 2,075,000 and has demonstrated that technically and economically the accumulator system of traction will bear comparison with that of steam.

In France, after the unfortunate experiences of thirty years ago this type of traction seemed to have been completely abandoned until comparatively recently. Since 1927, however, the system has attracted more and more attention and there are now 275 miles of track over which a regular service of accumulator driven vehicles is operated.

Electric traction by accumulators in Italy has been encouraged during the past six years for the following reasons:—

(1) The cost of maintenance and renewal of batteries is no longer an unknown figure inasmuch as the sellers of the batteries undertake the matter upon payment on a mileage basis.

(2) Electric traction by accumulators has the great advantage that it can serve as a preliminary installation for ultimate conversion, when traffic demands it, to an overhead trolley system.

Accumulator vehicles are to-day serving 220 miles of track in Italy, both upon tramways and upon local light railways.

Careful examination has shown that the initial cost of accumulator driven vehicles is less than that of vehicles driven by internal-combustion engines and also that there are many advantages to be obtained from adoption of the former method of traction, *e.g.*, great elasticity in service, absolute independence of each vehicle which carries its own source of energy, continuance of the service in the event of temporary interruption of generating plant, no expense for maintenance of overhead lines, simplicity and certainty of operation, higher commercial speed and cleanliness and silence in service.

It is for these reasons that services by accumulator vehicles have been extended in recent years, not only upon lines where traffic is light, but equally upon those where it is dense.

## PHENOMENA OF ELECTROLYTIC CORROSION.*

By M. R. Podoski,
Professor of Engineering at the Polytechnic School, Warsaw.

Scientists and technicians have long been occupied with the question of currents derived from electrical conductors in contact with the ground and uninsulated from earth, such as electric railway and tramway rails, as well as the electrolytic action to which such currents give rise. Although much has been written upon the subject, the matter is far from clear, and must be considered as one of the most complicated and least understood problems in the domain of electric traction.

In various countries elaborate regulations and recommendations have been issued with a view to the protection of metallic conduits buried in the earth from the action of stray currents derived from electrical conductors, and to avoid controversy in the case of damage arising. None of these regulations, however, completely fulfil the object to which they are directed.

The whole question has been very fully considered by an International Commission upon which the chief European tramway, railway, telephone, and gas undertakings were represented as well as the cable manufacturing industry which included representatives of such well-known firms as Callenders Cable & Construction Co., Ltd., British Insulated Cables, Ltd., and W. T. Henley's Telegraph Works Co., Ltd.

*Abstract of a paper presented at the Congress of the International Tramways Union at Warsaw on July 1st, 1930.

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The theory of the origin and action of the currents giving rise to electrolytic action is only vaguely understood. The great majority of electric railways and tramways use their running rails as conductors. These rails, placed upon foundations of various substances, are never properly insulated from earth. Seeing that the earth itself is an electrical conductor, part of the current passing through the rails is necessarily shunted and passes to earth. These stray currents in their passage encounter various subterranean metallic conductors, such as gas and water pipes, or the lead or steel sheathing of underground cables.

The earth, especially in towns, always contains in greater or less quantity various salts and acids which constitute an electrolyte, while the conductors giving or absorbing current act as electrodes and become subject to electrolytic action. This action gives rise to the decomposition of the salts, and their electro-positives, i.e., particles of metal, hydrogen, etc., carried by the current, are transported from the positive to the negative pole and replaced by electro-negatives such as oxygen, chlorine, nitrogen, and various acids.

The amount of metal decomposed by the current depends upon the quality of the metal and the quantity of electricity, and is the product of the intensity of current and lime.

Electrolysis in earth depends also upon the quantity and quality of the salts and acids mixed with the soil, and also upon its humidity. While the rate of action varies considerably, it is obvious that the constant decomposition of the metal must weaken the conductor, and it can in time cause serious damage such as bursting of pipes and rupture of cables. So far as the rails are concerned, the electrolytic action is not of great importance because of the heavy section of the rails themselves.

It will be readily seen that the action of these stray currents is excessively complicated since, in various cases, the factors are so difficult to define. For instance, there are differences in the composition and resistance of the soil, the section of the rails, the distribution of the current in a conductor so infinitely large as the earth, the resistance of metallic conductors such as pipes and cables, etc. Added to these are the fact that metals buried in soil are exposed to the action of acids which provoke decomposition without the aid of electric currents.

However good the insulation may be, it is impossible to completely avoid stray currents when the rails are used as conductors, and one can only attempt to reduce their effects to a point where they cause a minimum of damage although not totally suppressed. If, for example, the electrolytic action is so feeble that it needs for decomposition a period greater than the normal life of a pipe buried in the soil, such electrolytic action need not be seriously considered. If, on the other hand, all efforts to diminish the effects of stray currents fail, some scheme of protection for interested parties becomes a matter of necessity.

The Bureau of American Standards carried out a series of experiments in the years 1915–19 with the object of finding which type of rail foundation gave the best insulation, and some very interesting data was obtained.

Experiments of a similar nature carried out in various towns in Poland showed that while the laying of rails on wooden sleepers gave good results from the point of view of insulation, the highest resistances were obtained when the track was laid on a foundation of concrete, with a layer of asphalte, lime, and gravel in the proportions 25 per cent., 10 per cent., and 65 per cent. respectively.

Electrolytic action can be largely prevented by the employment of three conductors. With such a system, not only is the amount of current carried by the rails decreased, but the direction of the flow constantly changes, dependent upon the distribution of the loads in the positive and negative sections of the line. Change in polarity once in every twenty-four hours would decrease electrolytic action by at least 50 per cent., although it could not, of course, entirely suppress it.

Considered from the opposite point of view, efforts could be made to diminish the current in the underground metallic conductors so as to decrease electrolytic action. This might be done either by insulating the conductors, by increasing their resistance, or by making metallic connection between them and the rails. The danger in the first method lies in the fact that there is no known insulating medium which will stand up indefinitely in earth, and if such insulation broke down in patches, electrolytic action would be concentrated upon the few points where the conductor was deprived of insulation. Increase in the resistance of water and gas mains could be achieved by introducing insulation at the joints when laying the pipes, but this could only be regarded as a supplementary measure of protection.

It is impossible at the moment, owing to the absence of exact data, to prepare strictly enforceable regulations. They are, however, highly necessary if not indispensable, and when ultimately drawn up should be on the lines suggested by the International Tramway Union.

## MANCHESTER CORPORATION TRANSPORT.

### Comparison of Results for the Past Two Years.

The tables below show that during the past year the Manchester Corporation Transport Department enjoyed considerable increases in passengers and revenue. The combined receipts for tramways and omnibuses were £2,089,242, an increase of £60,046 on the previous year, and the number of passengers was 350,716,721, an increase of 7,689,246. Both systems of transport shared in this advance, the tramways by 1.08 per cent. and the omnibuses by 21 per cent., but the route mileage of the omnibuses was 210, compared with 172. The comparison of operating and other statistics, as between tramcar and omnibus, in Table II is of particular interest. It will be noticed that the cars earned more per mile than the omnibuses. Although the car mileage was only slightly more than last year, while the omnibus route miles increased by over 7,000,000, the additional passengers carried on the cars were nearly as many as on the omnibuses, being 3,471,425 and 4,217,821 respectively.

TABLE I.

Tramway Results for 1929 and 1930.

| | Year Ended March 31 | |
|---|---|---|
| | 1929 | 1930 |
| Lines open—single track | 290 | 292 |
| Gross receipts | £1,814,705 | £1,830,631 |
| Total operating expenses | £1,487,487 | £1,497,034 |
| Gross profit on working | £327,218 | £333,597 |
| Net surplus | £102,813 | £90,022 |
| Receipts per car mile:— | | |
| Average total per car mile | 17.808d. | 17.949d. |
| Average traffic per car mile | 17.702d. | 17.826d. |
| Operating expenses per car mile | 14.597d. | 14.678d. |
| Percentage of operating expenses to receipts | 82% | 82% |
| Total units used | 48,818,166 | 50,392,609 |
| Average units per car mile | 1.996 | 2.059 |
| Cost per unit | .905d. | .882d. |
| Population served | — | — |
| Car mileage | 24,456,250 | 24,477,216 |
| Passengers carried | 322,815,254 | 326,286,679 |
| Passengers carried per car mile | 13.20 | 13.33 |
| Average fare per passenger | 1.34d. | 1.34d. |
| Average car miles per day per car in service | 82 | 82 |
| Traffic Revenue per mile of track (single) | £14,261 | £14,348 |
| Average distance of 1d. fare, in miles | 1.574 | 1.574 |
| Average fare charged per mile | .635d. | .635d. |
| Number of cars in stock | — | 926 |

TABLE II.

Comparison of Tramways and Omnibuses.

| | Tramways | | Omnibuses | |
|---|---|---|---|---|
| | 1929 | 1930 | 1929 | 1930 |
| Total Revenue | £1,814,705 | £1,830,631 | £223,823 | £282,649 |
| Working Expenses | £1,487,487 | £1,497,034 | £175,758 | £221,435 |
| Gross Profit | £327,218 | £333,597 | £48,065 | £61,314 |
| Route mileage | — | 163 | 172 | 210 |
| Passengers carried | 322,815,254 | 326,286,679 | 20,212,221 | 24,430,042 |
| Operating expenses per car or omnibus mile | 14.597d. | 14.678d. | 10.480d. | 11.166d. |
| Vehicles in stock | — | 926 | — | 190 |
| Car or omnibus miles | 24,456,250 | 24,477,216 | 4,024,954 | 4,759,602 |
| Average distance per 1d. miles | 1.574 | 1.574 | .826 | .898 |
| Average fare per mile | .635d. | .635d. | 1.21d. | 1.113d. |
| Traffic revenue per car or omnibus mile | 17.702d. | 17.826d. | 13.439d. | 13.675d. |
| Working expenses per car or omnibus mile | 14.597d. | 14.678d. | 10.480d. | 11.166d. |
| Percentage of Working expenses to receipts | 82% | 82% | 78% | 82% |
| Average fare paid per passenger | 1.34d. | 1.34d. | 2.68d. | 2.66d. |
| Average passengers per car or omnibus mile | 13.20 | 13.33 | 5.02 | 5.13 |

## TRANSPORT FACILITIES FOR ATHENS.

Presiding at the eighth general meeting of Whitehall Electric Investments, Ltd., held at Winchester House, E.C., on July 23, the Hon. Clive Pearson stated that a modern generating station of 45,000-kw. capacity had been installed at Athens to meet the requirements resulting from the remarkable industrial and other progress of the city. The enterprise was supported by a guarantee of £2,000,000 by the British Government under the Trades Facilities Act. They were operating under a single long-term concession from the Greek Government extending to 1989. It would be the policy of the companies to improve and extend the transmission and distribution systems, to provide additional and better transport facilities, and thus to give efficient and comprehensive services to the public.

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## LONDON COUNTY COUNCIL TRAMWAYS.

NET SURPLUS OF £128,803 FOR THE YEAR, 1929–30.

At the meeting of the London County Council on July 22, the annual accounts of the tramways for the year ended March 31, 1930, were submitted by the Highways Committee. The introductory memorandum by the Comptroller of the Council (Mr. H. W. Stovold) showed that there was a surplus for the year of £128,803. In 1927-28 there was a deficiency of £226,211, and in 1928-29 a deficiency of £6,789. The chief factors in the improvement for 1929-30 are an increase of £86,391 in traffic receipts and a reduction of £72,564 in working expenses.

The results of the working of the undertaking during the year 1929-30 compared with the two preceding years are as follow :—

| | 1929-30. | 1928-29. | 1927-28. |
|---|---|---|---|
| | £ | £ | £ |
| Income ... ... ... ... ... ... | 4,460,536 | 4,373,944 | 4,333,783 |
| Working expenses (including special charges, £531 12s. 2d.) ... ... ... ... | 3,613,330 | 3,684,987 | 3,810,825 |
| Surplus on Working ... ... ... ... | 847,206 | 688,957 | 522,958 |
| Debt charges ... ... ... ... ... | 758,625 | 740,370 | 785,090 |
| Income Tax—Schedule D (in addition to property tax) ... ... ... ... | 20,436 | 15,923 | 37,283 |
| Parliamentary expenses ... ... ... | 312 | 2,552 | 1,151 |
| Amount due to Leyton Corporation... ... | 14,383 | 9,425 | 7,210 |
| | 793,756 | 768,270 | 830,734 |
| Less deductions : on account of Income Tax (£48,683), Rents (£8,521), Government Grant towards unemployment schemes (£4,753), interest on cash balances (£13,103), etc. ... ... ... ... | 75,353 | 72,523 | 81,567 |
| | 718,403 | 695,746 | 749,168 |
| Surplus for the year ... ... ... ... | 128,803 | 6,789 (Deficiency) | 226,211 (Deficiency) |

NEARLY 14,000,000 MORE PASSENGERS.

The total number of passengers carried during the year was 726,414,871, and the number of car miles run was 70,756,225 (net figures after adjustments in respect of inter-running). The corresponding figures for some previous years are set out in the table appended :—

| Year ended. | Route Length miles. | Expenses per car mile. | Receipts per car mile. | Car miles run. | Passengers carried. | Gross Traffic receipts. |
|---|---|---|---|---|---|---|
| | | d. | d. | | | £ |
| 1925 | 164·14 | 14·08 | 14·63 | 68,068,216 | 682,595,733 | 4,148,923 |
| 1926 | 164·44 | 13·56 | 14·53 | 68,530,795 | 690,222,969 | 4,148,998 |
| 1927 | 165·35 | 13·69 | 14·28 | 67,113,143 | 667,103,489 | 3,993,601 |
| 1928 | 165·72 | 12·70 | 14·37 | 69,890,518 | 705,762,261 | 4,185,550 |
| 1929 | 166·28 | 12·38 | 14·62 | 70,170,486 | 712,694,996 | 4,274,010 |
| 1930 | 166·28 | 12·03 | 14·79 | 70,756,225 | 726,414,871 | 4,360,401 |

The net operating expenses were £3,546,244, including special charges of £532, and the costs of renewals amounted to £198,899.

CAPITAL EXPENDITURE AND REDEMPTION OF DEBT.

The total net expenditure on the undertaking to March 31, 1930, amounted to £17,719,198, including £294,907 expended during the current year. The total amount of debt to March 31, 1930, was £18,126,719, and the net debt on March 31, was £8,300,593. The total provision for redemption of debt amounts to £9,826,125. During the year sums paid for rates on the permanent way amounted to £27,075. This was in addition to £71,693 paid as rates in respect of tramway offices, power station, car sheds, etc. The saving to the road authorities owing to the maintenance of the paving along the tramway routes by the Council was estimated at about £233,500. The amount charged to March 31, 1930, to the tramways capital account in respect of cost of street improvements along tramway routes is £752,280.

OBSERVATIONS BY THE GENERAL MANAGER.

The general manager in the course of a memorandum on the working of the tramways, says that the net working expenses, including all renewals, amounted to 12.029d. per car mile, as compared with 12.377d. for the previous year. The surplus on working amounted to 2.873d. a car mile, which compares with 2.356d. in 1928-29. Though there has been a considerable increase in the number of vehicles using the roads and in the congestion of traffic the car services have been maintained satisfactorily, and the average speed has increased from 9.77 to 9.86 miles per hour, including stops.

The popularity of the new type of car, which now represents the bulk of the fleet, has been reflected in improved receipts. The importance of through running services has increased. There are now 31 through services covering a route length outside the L.C.C. area of 95½ miles. The approximate car mileage during the year of these through services amounts to 25,000,000. Weather has a great effect on tramway receipts. Tramways thrive on mild wet weather excepting at week ends, when fine conditions are required to attract the public from their homes.

The cost of electrical energy for traction purposes, including debt charges was .687d. per unit as compared with .702d. in the previous year and .753d. in the year 1927-28. The units delivered aggregated 216,760,926, and the maximum load on the generating plant has increased by 2,000 K.W. to 55,000 K.W. The three latest boilers, the steaming capacity of which equals 27 per cent. of the boiler plant of the station, were available for a very short time, but with full use of this plant the generating costs will be still further reduced.

On week-days the maximum number of cars employed is 1,584, representing a per centage of 92.46 of the total of serviceable cars. During the year 554 additional cars were reconditioned and equipped with transverse upholstered seats in the lower saloon and upholstered seats in the upper saloon. There are now 1,388 of these cars. Contracts were placed for 150 new cars and delivery is now taking place. Two cars specially designed for operation on hilly routes have been put into service, and 50 cars of this type are included in the new contract. Fifty new bodies for the reconstruction of 50 single-deck as double-deck cars have been delivered.

Experiments have been carried out with various forms of windscreens for motormen, and a car fitted with the selected type has been in trial service. Mirrors to enable motormen to obtain a full view of the rear step are being fitted to the new cars. During the year 25 miles of single track were renewed. The welding of rail joints has been amply justified and is reducing the amount of renewal work required. Corrugations were removed on 63·97 miles of single track, and a specially designed equipment for dealing with high cheeks has been brought into service, with the result that this work is carried out at about half its former cost. The continued use of day and night mobile gangs has been a great advantage in dealing with emergency repairs over the whole system. In conclusion the general manager expressed his appreciation of the loyal co-operation of all ranks in promoting the interests of the undertaking. The memorandum was signed by Mr. T. E. Thomas (who is now general manager) for Mr. J. K. Bruce, who has since retired, owing to ill-health.

| STATISTICAL INFORMATION. | Year 1929–30. |
|---|---|
| Car miles run by Council's cars ... ... ... ... ... ... | 70,923,718 |
| Passengers carried on Council's cars ... ... ... ... ... ... | 722,888,777 |
| Total number of units used by cars (Greenwich power) ... ... ... | 172,644,923 |
| Number of units used per car mile ... ... ... ... ... ... | 2·636 |
| Average car miles per day per car... ... ... ... ... ... | 132·28 |
| Average speed per hour (miles) ... ... ... ... ... .. | 9·86 |
| Average car hours per day ... ... ... ... ... ... .. | 13·92 |
| Average number of cars in use ... ... ... ... ... ... | 1,472 |
| Average fare paid per passenger ... ... ... ... ... ... | 1·44d. |
| Average number of passengers boarding cars per car mile ... ... ... | 10·19 |
| Number of cars in stock ... ... ... ... ... ... ... | 1,800† |
| | Miles |
| Conduit system ... ... ... ... ... ... ... ... ... | 123·2933 |
| Overhead system ... ... ... ... ... ... ... ... ... | 34·1704 |
| Leyton Corporation overhead ... ... ... ... ... ... ... | 8·8216 |

† Includes 60 cars taken over from Leyton Corporation.

PARTICULARS OF FINANCIAL RESULTS SINCE 1921-22.

The Highways Committee submitted the following particulars of the financial results for each of the nine years ended March 31, 1930 :—

| Year ended March 31. | Payments out or Revenue before arriving at Surplus or Deficiency in Col. 6. | | | Estimated Paving Saving to local Authorities. | Deficit or Surplus. |
|---|---|---|---|---|---|
| | Rates Permanent Way. | Street Widenings Debt. | Other Debt Charges. | | |
| | £ | £ | £ | £ | £ |
| 1922 ... ... | 79,871 | 28,519 | 619,082 | 271,000 | — 88,757 |
| 1923 ... ... | 69,056 | 29,633 | 682,510 | 269,500 | — 232,327 |
| 1924 ... ... | 61,405 | 30,545 | 715,452 | 255,000 | — 160,222 |
| 1925 ... ... | 59,933 | 30,906 | 452,989 | 240,000 | — 278,441 |
| 1926 ... ... | 60,822 | 30,456 | 465,563 | 235,000 | — 114,629 |
| 1927 ... ... | 31,191 | 30,428 | 502,985 | 233,500 | — 275,159 |
| 1928 ... ... | 30,681 | 30,108 | 754,983 | 233,500 | — 226,210 |
| 1929 ... ... | 28,503 | 29,865 | 710,506 | 233,500 | — 6,790 |
| 1930 ... ... | 27,075 | 29,938 | 728,687 | 233,500 | + 128,804 |

## GLASGOW TRAMWAY DEBT FREE.

Glasgow's municipal transport undertaking is now again almost free from debt. The annual accounts show that since 1917, when the undertaking was last free of debt, large sums have been expended on extensions, widening and reconditioning of rolling stock. The indebtedness at present is £3,388,960. This is balanced by a sum of £3,387,992 in a depreciation and a renewals fund. The department has also about £100,000 in general reserve, third-party risk and other insurance funds. Taking these into account, there is a surplus of £90,000 over the indebtedness.

Since 1894, when the Corporation began to work their tramways, the capital expenditure has amounted to £8,019,000. During that period £1,250,000 has been paid to the Common Good Fund of the Corporation, and £2,750,000 in city and county rates.

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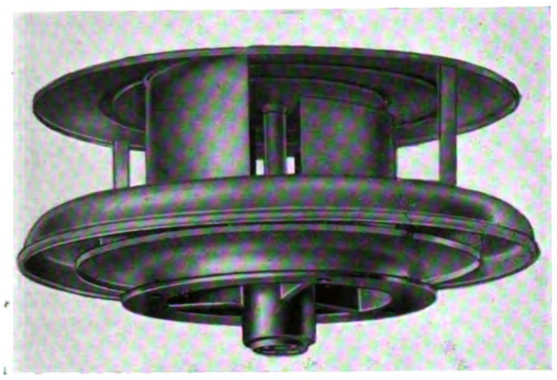
## A NEW TYPE OF VENTILATOR.

THE "FLETTNER" ROTOR SUCTION.

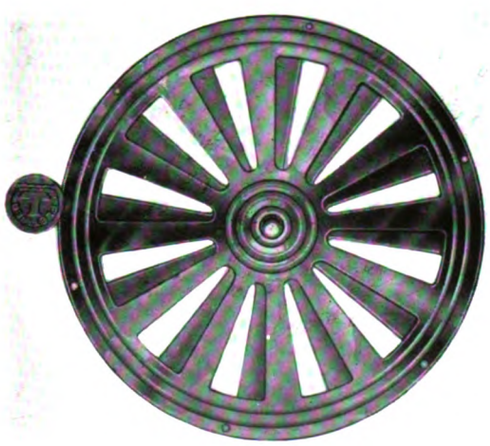
An interesting appliance for ventilating tramcars, omnibuses, coaches, railway carriages, etc., is the "Flettner." This device is the invention of Mr. Anton Flettner, inventor of the rotor ship which attracted world attention some time ago. Mr. Flettner has adapted the same principle for his ventilator, which is air currents acting on a rotor as the motive power. These air currents are supplied by the movement of the vehicle.

The appliance consists of a rotor connected to a centrifugal device fitted with vanes and attached directly under the lower plane of the rotor. These vanes, when rotated at high speed, extract the stale and used-up air from the vehicle and pass it out over the roof. The spindle to which both the rotor and the centrifugal device are attached runs on ball-bearings enclosed in an oil box, ensuring permanent running conditions without attention. Even when the vehicle stops running the ventilator continues to function for some minutes by its own momentum, and if a wind is blowing it will run continuously without any movement of the vehicle. This of course ensures good ventilation even when the vehicle is at a standstill. The amount of air extracted from the vehicle can be regulated by means of a shutter, which can be closed or half-closed as required.



The "Flettner" Ventilator.

In contrast to the stationary or fixed ventilation suction system it will be seen that the action of the "Flettner" does not wholly depend upon a pure suction action, as the rotor is driven centrifugally by the air current created by the movement of the vehicle.



Shutter of "Flettner" Ventilator Half-closed.

The illustration shows that thought has been given to appearance; this ventilator is indeed rather attractive than otherwise, owing to its compactness and neat finish, while in many cases it can be combined effectively with the lighting.

Fitted in heated vehicles it is claimed for the "Flettner" that the temperature does not suffer to any appreciable extent, even in very cold weather, and that it keeps the air sweeter and prevents stuffiness. It seems also to have great advantages in all weathers. When wet it remains open, as it is impossible for rain or draughts to enter the vehicle, while during dry periods dust cannot pass through. These features are an advance on the flap and fanlight ventilators, which have to be closed during wet or cold weather, and ensure greater comfort for passengers.

For tramcars it would seem to be well adapted. These vehicles require ventilators which have an extensive action at slow speed and will operate while the car is stationary. These requirements are met by the "Flettner" as it is so well balanced and adjusted for easy running that the slightest air current will immediately set it in motion, and it will run for some time after the car stops.

Further advantages are that it can be fitted to existing vehicles, the initial cost is small, there are no running costs, and it does not require any attention.

Although the "Flettner" ventilator is new to this country, we understand that it is now in wide use on the Continent and in America. On the Berlin tramways 3,500 have been fitted and they have proved entirely satisfactory. The Peckham Truck and Engineering Co., Ltd., Stafford House, Norfolk Street, Strand, London, W.C.2, are the exclusive agents for the British Empire, and they will be glad to demonstrate the appliance and to supply sample sets for trial purposes.

## LIVERPOOL'S TRAFFIC PROBLEMS.

SIR H. MAYBURY SUPPORTS THE TRAMWAYS.

Liverpool City Council in May, 1929, asked Sir Henry Maybury to investigate and report on city traffic problems, with special reference to the new Mersey Tunnel, and on the advantages and disadvantages of tramways and motor omnibuses. Sir Henry's report with his recommendations was issued on August 3.

He states that it would not be feasible or economic to construct an underground tube system. He also considers that no useful passenger traffic advantage could result from the physical communication with the over-head railway, which consists of six miles of double track, and the tramway system. Sir Henry makes important proposals for securing direct access to the docks and the centre of the city from the East Lancashire Road by means of the Everton Tunnel Road, but also recommends certain street improvements.

Regarding the 167 miles of tramway track, he states that the work now being undertaken and foreshadowed, leads him to believe that the track is in excellent condition, and that it will have a long and useful life. The improvement of the cars generally has not kept pace with the maintenance of the track and with the demand for increased comfort and travel. A car capable of much higher speed without much discomfort appears to be desirable—*i.e.*, a larger and different type of vehicle constructed on the bogie principle. It should be designed to seat seventy to seventy-four passengers and have upholstered seats. With such a car, eighty-five people could quite well be accommodated during the rush hours. The Liverpool tramways have done so well over a long period of years, viewed from every standpoint, that Sir Henry cannot help thinking that they have a good economic future if more up-to-date rolling stock is obtained as soon as possible. "In London," he says, "the maintenance of higher standard of comfort and efficiency has enabled tramways to increase their traffic, even at the expense of the omnibuses," and he is quite sure that a similar result can be secured in Liverpool. The cost of operating a well organised and well managed tramway, amid a considerable potential travelling population, is probably lower per seat mile than is the case with any other passenger vehicle, save perhaps the trolleybus.

In its tramways, Sir Henry states, Liverpool has an excellent investment capable of serving the public extremely well for many years and of earning large sums of money for the ratepayers. The financial position for 1929 was very convincing of the soundness of the undertaking as a whole. Liverpool's tramway system is the fourth largest as regards mileage and passengers, and with the exception of Glasgow, the ordinary fares charged in Liverpool are the lowest. Sir Henry considers, however, that it would be unwise to contemplate any extension of the system, having regard particularly to the great improvement in trackless trolley vehicles and motor omnibuses. Sir Henry speaks highly of the trolleybuses, their cheap working, carrying capacity, comfort, flexibility, noiselessness, and the absence of offensive odour. Their average speed in the twenty-four towns where they are in operation is 8.75 miles per hour as compared with the Liverpool tramways' average of 8.5 miles. However, the time is not likely to arrive very soon when any substantial part of the Liverpool tramway system will be abandoned in favour of trolleybuses. Rather than provide overhead equipment for trolley vehicles, Sir Henry suggests that it will be the policy of the Corporation to augment its transport services by additions to the omnibus fleet.

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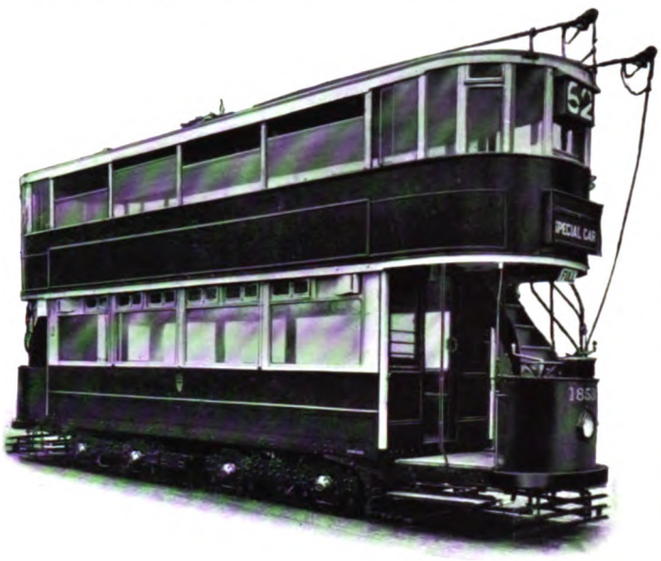
## THE "ASHANCO" VENTILATION SYSTEM.

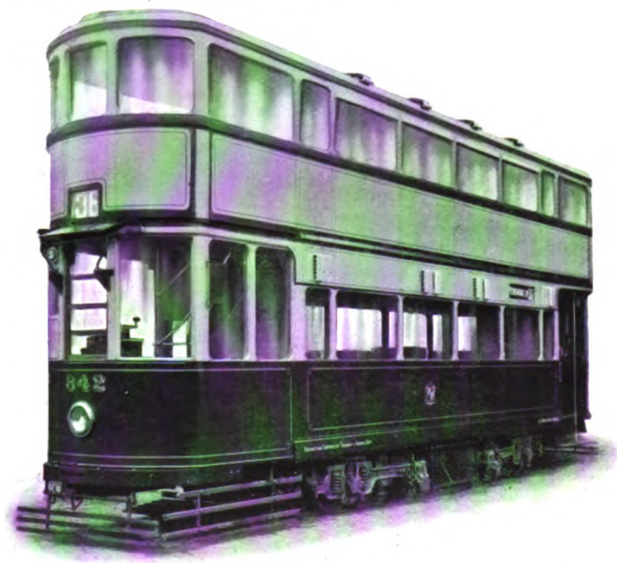
A well-illustrated brochure descriptive of the "Ashanco" patent system of ventilation for all types of moving vehicles is now being circulated by Messrs. George Johnston, Ltd., of 173–177, Shaftesbury Avenue, London, W.C.2, the sole concessionnaires.

The "Ashanco" system is designed to give perfect ventilation without draught, and as the extractors are made in various sizes, it can be equally effective on all types of vehicles from the small private saloon car to the double-deck London County Council tramcars, the latest types of which are now being fitted. A notable feature of the system as applied to omnibus ventilation is the low



"Ashanco" Air Extractors fitted to lower deck of L.C.C. Cars.

velocity air intake for use in conjunction with the air extractor. This is fitted to the front bulkhead and has been designed to permit an ample volume of fresh air entering the vehicle at a velocity of only 3 or 4 miles per hour. Actual tests on a London omnibus have shown that at the maximum speed permissible this air velocity has not been exceeded, and that the volume has been sufficient to change the air in the interior every 3 or 4 minutes.



Birmingham Car with "Ashanco" Extractors on top deck. Intake on lower saloon.

Each of the types of extractors is shown in the brochure both in detail and when fitted to the vehicles. The illustrations are all from photographs, and give a comprehensive idea of the formation and appearance of the component parts as well as the approximate size and position of the extractors when fitted. There is also a synopsis of tests taken by anemometer instruments on tramcars, omnibuses, and various types of cars so that reliable information is available to aid in the selection of the most efficient type of extractor for any particular class of vehicle.

The illustrations given herewith are of the latest types of tramcars now being put into service by the London County Council and the Birmingham Corporation. In the former the lower saloon is fitted with four No. 3 type extractors, two for each direction of travel, and on test it has been found that the entire cubic contents of the saloon is changed every six minutes at ordinary traffic speed with all doors and windows tightly shut. In the Birmingham cars "Ashanco" air extractors are fitted to the top deck and the new type "Ashanco Intake" to the lower saloon. The result of anemometer test on these cars shows a change of air every 3½ minutes.

## BRADFORD TROLLEYBUS SCHEME.

Ultimate Conversion of Many Tramway Routes.

The Bradford Corporation (Trolley Vehicles) Bill, received the Royal Assent on August 1. It confirms a provisional order by the Minister of Transport authorising about 40 routes for trolleybuses. These are mainly inside the city, although some are outside, and most of them relate to tramway routes on which it is proposed to substitute trolleybuses when the tracks need reconstruction. As the Corporation has powers to run omnibuses on all the routes it will be possible for them to operate motor omnibuses wherever considered desirable or necessary, pending the conversions. In the evidence given before a Select Committee of the House of Commons, the cost for equipping the routes for trolleybuses was given as £494,571. The alternative cost of relaying 35 existing tramway tracks, as they required renewal, would be £916,000. Mr. R. Harker, K.C., for the County Council asked that trolleys and tramcars should not be allowed to run on the same route at the same time. Mr. Wilkinson, the general manager, had agreed that the Corporation only wanted to do that temporarily during conversion. The County Council also asked that if the powers, so far as they affected the county roads, were not fully exercised within five years, they should cease, with an appeal to the Minister of Transport. The starting and stopping points, they asked, should be fixed on the county roads in accordance with the reasonable views of the County Council, but with an appeal to the Minister. On the question of the turning points the Corporation had agreed that those on the county routes should be settled by the Minister. The County Council asked that on no bridge should a turning point be allowed. On county routes he asked that the County Council should have the controlling voice as to when the tramways should be removed. As to the restoration of the roadway, it had been agreed that the County Council should do the work, and they suggested that equity demanded that the Corporation should pay for restoration to the standard of the rest of the road. The Corporation (for whom Mr. Craig Henderson appeared), proposed that the county should pay the difference between their legal obligation and present day standards of construction. The amount of difference had been estimated at about £20,000.

The Committee approved the Bill, but decided that there should be no turning points or stopping places on bridges. On the question of road restoration, the Committee decided that Bradford Corporation should make a money contribution to the County Council on the basis of their liability under the Tramways Act, and not on the basis of modern standards, and that the County Council should be responsible for the roads.

## TORQUAY AND THE REJECTED BILL.

The Torquay Town Council discussed on July 28 remarks alleged to have been made by Councillor F. Darke Bennett reflecting on the impartiality of the Mayor, Mr. E. H. Sermon, towards the Torquay and Paignton Traction Bill which was recently rejected by the House of Commons. Mr. Bennett was alleged to have stated that the Mayor's influence was more on the side of the Tramway Company than on that of the ratepayers. The Council unanimously passed a resolution expressing complete confidence in the Mayor and stating that his conduct had always been impartial and indeed beyond reproach. Commenting on the rejection of the Bill, the Mayor said that Mr. McKinlay, who moved the rejection in Parliament, was wrong in asserting that there was no provision for workmen's fares. The company would have been compelled, as before, to run trolleybuses for workmen morning and evening at ½d. per mile. Nor would the company have received higher fares. The present authorised fare was 1d. per mile, with a minimum fare of 2d., but under the Bill the authorised fare would have been 1d. per mile with a minimum fare of 1½d. A request from the Citizens' League to consider the acquisition of the tramways system was allowed to lie on the table, members of the Council stating that the idea of purchasing the tramways was preposterous.

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## A COMBINED TICKET AND CHANGE MACHINE.

British Firm's Successful Production.

In the adoption of time and labour saving mechanical devices no undertaking shows greater enterprise than the Underground Railways of London. Their system being unique in this country the company are always searching for special devices which will maintain smooth and steady working of their staffs and be of advantage to passengers. The installation of extensive batteries of automatic ticket machines is one method by which speed is gained, particularly during the rush hours, and these are much appreciated by the public. Useful as these are, however, it has been recognised that if they could supply a ticket and change at the same time it would be a much greater convenience when a passenger is without enough coppers. The one-man-operated booth was then installed, but this is not sufficient as it requires two operations—changing the silver and obtaining the ticket. If both operations could be combined a further saving of time would result, so the Underground handed their problem for solution to engineering firms at home and abroad. A " bunch hopper " was then produced ; into this the coppers could be thrown in a bunch, saving the time of inserting them singly. This was a step in the right direction, but was not sufficient.

A British firm, Messrs. Brecknell, Munro & Rogers (1928) Ltd., of Bristol, who are experts of long standing in all forms of coin-operated mechanism, started to give this problem very careful study. They primarily set out to eliminate electric contacts and solonoids and to produce an entirely mechanical machine. After approximately two years of experiment they were finally successful in producing what appears to be the ideal machine, unique in appearance, as well as in operation. The illustrations show that it is an improvement on the present types.

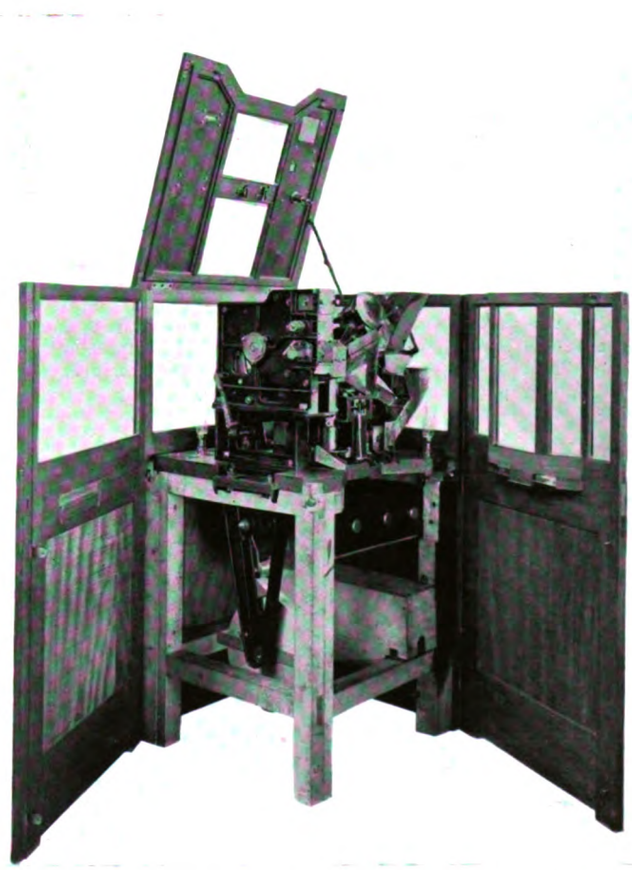
It has been tested both at Victoria and at Charing Cross Underground stations. It will accept half-pennies, as well as pennies, in any combination, according to the value of the ticket it is set to give. It also accepts shillings and sixpences and delivers the ticket and change at the same time. The machine illustrated is set to give 3d. tickets. In the majority of cases a passenger is almost sure to have a sixpence, a shilling or the price of the ticket in copper (half-pennies or pennies) and he has the choice of using either. Tickets of other values can be issued by the same machine by merely varying the ticket-printing rollers and making one or two other minor adjustments. As the coppers are thrown into the machine in a bunch they are quickly sorted and counted and the exact amount shown on a dial in full view of the passenger, who can see at a glance if in his haste he has not thrown in sufficient and can then add the additional amount. If a passenger with three or four or even more friends all throw their money in together the machine does not jam, but counts the money and gives the correct number of tickets required. Separate slots are provided for silver coins, which are given finer tests than the copper before they are accepted. Rejected coins are returned to the passenger and the fairly new sixpences and pennies go to fill the change containers. Good, but reasonably worn coins are accepted and pass through the till, as they are not suitable for the change-giving mechanism.

In addition to handling the coins in this way, the machine also prints, dates, numbers and severs the tickets from a roll of plain paper reeled in the base. Each roll produces approximately 2,000 tickets and provision is made to ensure that it is not possible for passengers to lose their money if by any chance the roll is exhausted or becomes broken, etc.

All the operations are entirely mechanical. This dispenses with the usual electrical contacts which are difficult to control and need fairly frequent attention. The mechanism is kept working by a small electric motor, which has a very low power consumption ; there is therefore no waste of time in starting the mechanism after the drop of the coin, and the result is instantaneous action. The whole of the working parts operate steadily and smoothly in ball races, thus reducing friction to a maimum and making the life of the machine lengthy. The interior being illuminated, the operating parts can be watched through the windows, and this has already proved a big attraction to passengers. When not in operation, the lid, the inside of which is utilised as an instruction board, is simply closed down and locked. The rate of output is such that it enables a continuous stream of passengers to secure tickets at a slow walking pace with scarcely a perceptible halt. This has only been achieved by a careful study of actual traffic handling requirements, and the realisation that every second saved by the machine at each operation is multiplied hundreds of times during its sixteen or eighteen-hour day.

Another satisfactory feature of this machine is that it is British throughout. Even the castings are made in Messrs. Brecknell, Munro & Rogers' own foundry, and it is pleasing to record that a British firm leads in this direction.

The combined Ticket and Change Machine set to supply 3d. Tickets.



The Machine Open Showing the Working Parts.

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## ENGLISH ELECTRIC CO.'S NEW CHAIRMAN.

**Sir Holberry Mensforth** has been elected a director of the English Electric Company, and appointed chairman of the board. Mr. W. L. Hichens, who in October last accepted the chairmanship as a temporary arrangement, has resigned that office and retired from the board, now that the reconstruction of the company has been completed.

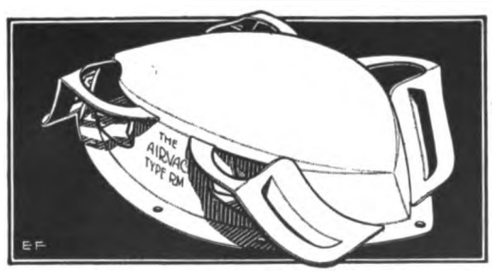
## TROLLEYBUSES FOR DERBY.

The Derby Town Council, at a meeting on July 31, approved the recommendation of the Tramways Committee to substitute trolleybuses for the tramways, and to develop omnibus services for cross-town traffic. Alderman Salisbury emphasised the heavy cost with which they were saddled in maintaining the track, which was nearing the end of its life, while of the present 78 cars, 28 should be "scrapped," and 20 others needed large expenditure for renovation. The Committee recognised that the call of the public to-day was for speed, and they pointed to the advantage of the trolleybus, stating that four trolleybuses were equal to five tramcars. Six-wheel vehicles were recommended as most suitable for Derby.

## THE RESPECTABLE TRAMCAR.

FROM A CORRESPONDENT.

If any attempt were made to classify road vehicles by the estimation in which they are held by the public a varied list of endearing and other epithets would result. So far as the tramcar is concerned, its moral attribute has been designated by Mr. Morrison, the Minister of Transport, who in Parliament recently described it as "an eminently respectable vehicle working on fixed rails." But the laughter with which this description was received by the Members of Parliament suggests that it was more witty than exact. Yet we cannot believe that Mr. Morrison meant to be disrespectful to the tramcar, for has he not been called the "godfather of the trams"? In these days, however, the word respectability can be used in such a way that the object is shorn of the blushing honours that should surround it. Obviously, it should inspire respect, and while many of those who make constant use of the tramcar may have a certain amount of attachment and goodwill for it, respectability alone is too like the elderly Victorian lady who is out of date and somewhat despised because of her primness. We prefer the description given by Councillor Dollan of Glasgow, who regards the tramcar as the vehicle of adventure, which is, at any rate, more romantic than being merely respectable, although there is no reason why a tramcar should not be both and still be modern. No poet, says Mr. Dollan, has sung of the motor 'bus, but one has played the lute in honour of the tramcar, and Arnold Bennett has made it a subject of charming prose in one of his books. Certainly it creates a more sociable atmosphere than its contemporaries, in spite of its transformation into a first-class pullman, although we hope the transverse seat does not kill this friendly side. Being now more like a Rolls Royce on fixed rails, the tramcar is become both adventurous and respectable, combining the enthusiasm of youth with the experience of age, and perhaps feeling a little envious as it surveys its more youthful rival that straggles all over the road like an unrespected and shameless toper.

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## LONDON'S UNDERGROUND STATION GARDENS.

The creation of a garden of flowers is one of man's methods of expressing his admiration for the beautiful in nature. On the Underground railways of London it is encouraged by the directors, and every year there is a competition for the most attractive gardens on the stations and adjoining plots of ground. This year's adjudication on the District Railway took place on July 22, when several directors and officials made a tour of the competing stations and at the end gave their decisions. Conditions of course vary on different parts of the line, and cultivation in the immediate vicinity of Underground stations is not always easy, but these varying conditions are taken into consideration, the effort made being of great importance when marks are being awarded. Many of the gardens are situated only a few feet away from the rails, and some can only be touched by the sun for a very short time each day, as at the Minories Junction, where the plots are surrounded by high walls. At other places

**Judging the Underground Station Gardens.**
**The adjudicators at Walham Green Station.**

*Left to right:* Col. Sir Herbert Jekyll, Mr. T. Hay, Sir Ernest Clark, Mr. Murray Griffith, Mr. J. C. Mitchell, Mr. J. Thornton.

little plots of ground seemed as if they had been simply snatched from the line or the end of a platform and made to bloom with flowers like an oasis in the desert. In spite of the obvious difficulties the amateur gardeners are extraordinarily keen, and the result is a remarkable display in unexpected places, gratifying no doubt to the gardener as well as to passengers. Over thirty stations had entered the competition, and all the plots showed evidence of much tender care and a good deal of work. Each competitor is granted a small sum of money for the purchase of seeds, and in some cases help is given by the company in providing the necessary soil. Handsome cash prizes are presented to the winners.

The judges were: Col. Sir Herbert Jekyll, Mr. Murray Griffith, Sir Ernest Clark (Directors of the Railway), Mr. J. C. Mitchell (Secretary and Treasurer), Mr. J. Thornton (Superintendent of the Line), and Mr. T. Hay (Superintendent of the Royal Parks).

The following awards were made:—First prizes: Ealing Common and Ealing Broadway. Second: Walham Green (east platform), Acton Town (signal depot), and Acton Town (east platform). Third: Walham Green (west platform), Acton Town (east platform), and Northfields. Fourth: Minories Junction, Sudbury Town, and Boston Manor. Twelve fifth prizes were also awarded.

## TROLLEYBUSES FOR LANCASHIRE TRAMWAYS.

The South Lancashire Tramways Company on July 30 substituted double-deck trolleybuses for tramcars on seven miles of their route from Atherton to Ashton by way of Hindley. Later the trolleybuses will be used throughout their routes. The South Lancashire Tramways form part of the undertaking of the Lancashire United Transport and Power Company. Their tramcars operate over 37 miles of the industrial area that extends from Manchester through Salford to Bolton, thence to Atherton, Hindley, Ashton-in-Makerfield and Lowton St. Mary's. The company considers that the trolleybus provides the best solution of the problem of town and suburban traffic.

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# TRAMWAY AND LIGHT RAILWAY NOTES.

## AYR.

FUTURE OF THE TRAMWAYS.

At the last meeting of Ayr Town Council a minute of the Tramways Committee with regard to the reconditioning of the cars stated that the manager had been authorised to accept the tender of the British Thomson-Houston Co. for motors and electrical equipment for three cars. The Town Council disapproved the minute, and Treasurer Galloway said that at the next meeting he would move that a plebiscite be taken of the ratepayers as to whether they desired the tramway undertaking to be continued or not.

## BELFAST.

A POSSIBLE UNIVERSAL PENNY FARE.

At a meeting of the Corporation the chairman of the Tramways Committee, Coun. McClure, intimated that the general manager of the tramways, Mr. W. Chamberlain, was considering the idea of an extension of all the tramway stages and possibly a penny universal fare in the future. He congratulated Mr. Chamberlain on his excellent management, which had resulted in a profit of £92,000 during the past year.

## BOLTON.

FUTURE OF THE TRAMWAYS.

At the annual inspection of the Bolton transport undertaking on July 9, Councillor Bradley, chairman of the Tramways Committee, said they had routes on which the track would not be relaid, and it was important that they should begin to consider alternative means of transport. For short town distances he considered the trolleybus the most economical and best method, but some of the routes were still best served by the tramcar.

## BRIGHTON.

FARES TO BE REDUCED.

On October 1 the existing 1½d. and 2d. fares on the Brighton tramways will be reduced to 2d. and 3d. return, except in those cases where such a change would make half the return fare less than the pre-war single fares. All "through" tickets to or from the railway station are to be 2d.

## EDINBURGH.

AN EXPERIMENTAL TRAMCAR—NEW BODIES BEING CONSTRUCTED.

A proposal of the transport manager (Mr. F. A. Fitzpayne) that £4,000 be spent on building an experimental tramcar, has been approved by the Public Utilities Committee. The manager stated that such a car would be a great asset in maintaining efficient services and would permit the introduction of all the latest ideas in construction and equipment. Mr. Fitzpayne in a report to the Transport Sub-Committee, states that the department is building 88 new tramcar bodies and covering in the canopy ends of the upper decks of 188 more, at an estimated cost of £100,204. These will not be completed until 1934 or 1935.

## GATESHEAD.

CHEAP HOLIDAY FARES FOR CHILDREN.

Gateshead and District Tramways Company has granted cheap fares for school children during the summer holidays. Special cars are run one day in each week at 1d. fares for the return journey to Saltwell Park.

## HULL.

EFFECT OF FREE RIDES.

The report of the committee investigating the causes of the low surpluses of the Hull tramways shows that free rides given to old-age pensioners, blind persons and others last year reduced the revenue by £36,000.

## ILFORD.

NO TRANSFER TICKETS.

Mr. L. E. Harvey, general manager and engineer of Ilford Corporation Tramways, in a report to the Tramways Committee on transfer tickets, states that there is a consensus of opinion among tramway operators against their use. The difficulty of checking them and the abuses to which they are subjected by passengers are two points against them. Except in a few occasional instances, Mr. Harvey does not consider that transfers are wanted, and as far as Ilford is concerned, they would be, he says, in effect a form of concession that the undertaking cannot afford at the present time.

## KEIGHLEY.

PROPOSED SALE OF TRAMWAYS.

The Tramways Committee, which has received an offer to buy the tramways undertaking from the West Yorkshire Road Car Co., is waiting for a report from Mr. A. R. Fearnley, general manager of Sheffield Corporation Tramways, who is acting as consultant in the matter.

## LEAMINGTON.

ROAD RESTORATION AGREEMENT.

The Leamington Corporation has made an arrangement with the Leamington and Warwick Electrical Co., Ltd., whereby, it is understood, the company will remove the tramlines, etc., and the Corporation re-lay the road surface at 5s. 6d. per yard.

## LEEDS.

TRAMWAYS POWER STATION.

The question of scrapping the Leeds Tramways Department's power station at Crown Point, and the purchase of the whole of the supply from the Electricity Department, is to come under review in the near future.

## LEICESTER.

MORE FREE PASSES.

The City Council has agreed that seven members of the Public Assistance Committee who are not members of the Council shall be granted free passes on the Corporation tramcars and omnibuses. Coun. W. K. Billings, vice-chairman of the Tramways Committee, says that some of the members spend as much as six shillings a week visiting the Scattered Homes and boarding-out cases.

## LONDON.

CHEAP SUNDAY AND SCHOOL CHILDREN'S FARES—NEW REPAIRING MACHINES—14 TRANSPORT VEHICLES TO BE PURCHASED—SUBWAY STATIONS TO BE MODERNISED—EXTENT OF L.C.C. SYSTEM.

The L.C.C. has introduced 2d. all-the-way tramway fares on Sunday to operate during August, September, and October, and during the autumn session of 1930, fourpenny "all-day" tickets to school children between 8 a.m. and 5 p.m. Additional machinery to cost £2,630 is to be purchased by the L.C.C. for the tramways Central Repair Depot, also a grit collector apparatus costing £900. The track between Murdock Cottages and Mile End Road is to be doubled at a cost of £2,000. Fourteen mechanical transport vehicles to replace old vehicles are to be purchased for the L.C.C. tramways department at an estimated cost of £9,790. Aldwych and Holborn stations, on the Aldwych tramcar subway are to be modernised and redecorated, the estimated cost being £6,000. Mr. T. E. Thomas, general manager of the L.C.C. tramways, speaking at Clapham Rotary Club, said that including 166 miles of route owned by the Council and 90 miles owned by adjoining authorities over which the Council's cars run, the whole system covered 250 miles of street. The weekly consumption of coal at Greenwich power station was 4,000 tons.

## ROTHESAY.

ADDITIONAL POWER PLANT.

The Rothesay Tramways Co. have intimated that they are willing to take current from the Council's electrical supply. Additions will be necessary to the plant and the electrical engineer has been instructed to prepare an estimate of the cost.

## SALFORD.

FARES REVISION.

A sub-committee of the Tramways Committee is to be appointed to consider adjustments in omnibus and tramcar fares and stages, owing to the heavy loss on the tramways last year.

## SCARBOROUGH.

COUNCIL AND TRAMWAYS ACQUISITION.

The Town Clerk has presented to the Transport Committee a report dealing with the Council's powers under the Tramways Act, 1870, with regard to the acquisition of the local tramways undertaking. The committee have decided that before they can make any further report they should know the Council's policy with regard to such acquisition.

## SHEFFIELD.

SUGGESTED EXTENSION STOPPED BY COUNTY COUNCIL.

The Corporation desired to extend the present tramway terminus at Meadow Head, to Four Lane Ends, about a quarter of a mile. This would bring the tramways into the area controlled by the Derbyshire County Council, which has refused permission.

## SOUTHAMPTON.

A CIRCULAR ROUTE.

The opening of a new tramway route along Burgess Road from Bassett to Swaythling, Southampton, on July 10, has made it possible to run cars on the circular route.

## SOUTHEND.

IMPROVED RESULTS.

At the last meeting of the Town Council, Mr. W. J. Perrett (chairman of the Tramways Committee), in introducing the annual accounts for the year ending March 31, gave a comparison between the average financial results for the ten years ending March 31, 1929, and the results for the last year. The mileage run showed an increase of 288,315, and the passengers carried an increase of 2,203,293. There was a total increase in income of £2,763 and a reduction in working expenses of £1,296.

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## PERSONAL.

**Mr. A. H. Shaw,** borough electrical engineer of Ilford Corporation, has been granted an increase in salary to £1,275 per annum.

**Mr. H. J. Sheppard** has been appointed managing director of Johnson & Phillips, Ltd., in succession to the late Mr John MacGregor.

**Mr. J. Harcourt Williams,** of British Thomson-Houston Co., has been appointed deputy chief-engineer to the Manchester Electricity Dept.

**Mr. G. H. Nisbett,** managing director of British Insulated Cables, Ltd., has received the honorary degree of Master of Engineering at the University of Liverpool.

**Mr. F. J. Elliott,** of Bristol Corporation Electricity Department, has been appointed chief assistant electrical engineer of the Wolverhampton Corporation.

**Mr. Wallace Jones,** until recently a motorman on the Birmingham Corporation Tramways, has been appointed first tuba player in the famous Hallé Orchestra, Manchester.

**Mr. Theodore Petersen,** one of the joint managers of Callender's Cable & Construction Co., Ltd., has been appointed assistant managing director with a seat on the board.

**Mr. W. Chamberlain,** general manager of the Belfast Corporation Tramways, has presented to the Royal Victoria Hospital the £100 recently awarded him in his action for libel.

**Lord Trenchard,** Marshal of the Air Force, has been elected to the board of the Goodyear Tyre and Rubber Co. (Great Britain), Ltd. The company has a factory at Wolverhampton.

**Mr. C. F. Wolsey,** of Sheffield, has been appointed traffic superintendent to Stockport Corporation Tramways in succession to Mr. Charles Sprowson, who has retired on account of ill-health.

**Mr. G. H. Brookes,** accountant and chief clerk of the L.C.C. Tramways, was appointed to act for the general manager during his vacation, pending the completion of the organisation of the department consequent upon the promotion as from July 1, 1930, of Mr. T. E. Thomas to the position of general manager.

**Mr. John Johnston,** a tramcar and latterly an omnibus conductor, and formerly with the Edinburgh and District Tramways Co., who has been in the service of Edinburgh Tramways for forty years, has received a presentation of a wallet containing over £30 on his retirement. He was described as a "model conductor."

**Mr. H. Shorland,** who recently retired from the position of inspector in the Sheffield Corporation Tramways Department after thirty years' service, has been presented with a wallet of money from the Sheffield branch of the Transport and General Workers' Union. Councillor T. Garnett (vice-chairman of the Tramways Committee) made the presentation and said that Mr. Shorland had done much to build up the present tramway system.

**Sir George Hume,** who recently resigned his membership of the Highways Committee of the London County Council, had served on the Committee continuously over a period of twenty years. During five years—1914-19—he was Chairman of the Committee. Throughout his long connection with the undertaking he gave invaluable service, and the Highways Committee recently recorded their high appreciation of his services.

**Mr. A. L. Lunn,** deputy chief engineer, Manchester Corporation Electricity Department, has been appointed to a new position with the Underground Railways Group of London. The duties relate to the generation, distribution and future developments of power for the allied companies. The Manchester undertaking has grown ten times its original size during Mr. Lunn's nineteen years' service in that city. He will assume his new duties in September.

**Mr. Cyril Dennis,** of Messrs. W. B. Dick & Co., addressed the members of the St. Helen's Rotary Club on July 14 on "Russia of To-day." There was a large attendance, including Alderman Rudd, chairman of the St. Helen's Corporation Tramways Committee. Mr. Dennis has addressed a number of Rotary Clubs on the same subject, and his remarks should go far to create a constructive interest in the problems with which Russia is faced.

**Mr. Edward Nolan,** who recently retired on account of his health from the post of traffic manager of the Scottish General Omnibus Co., has been presented with a wallet of Treasury notes and a pipe and case from the whole of the staff throughout Scotland. Mr. Nolan began as a conductor with the Falkirk and District Tramways Co., but gained promotion, and during the war was acting traffic superintendent. It is said that he was the first to introduce women tramcar drivers in Great Britain during the latter part of the war. Since 1919 Mr. Nolan has been engaged with the Glasgow Omnibus Co. He continues his connection with the Falkirk Traction Co., formerly the Tramways Company, and will continue as manager.

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The late **Sir Alexander Gracie,** a director of the English Electric Co., Ltd., and Cammell Laird & Co., Ltd., left personal estate valued at £123,876, in addition to real estate.

**Mr. R. G. Selbie, C.B.E.,** general manager and a director of the Metropolitan Railway, who died on May 17, left estate of the gross value of £67,724, with net personalty of £32,706.

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**Mr. P. G. Campling,** borough electrical engineer and tramways manager at Great Yarmouth, has been appointed by the Central Electricity Board as district engineer in East England under the East England Electricity scheme. In May, 1922, Mr. Campling was appointed to his present position, and in later years was responsible for arranging bulk supplies to Lowestoft Corporation and the township of Bungay, as well as for rural supplies in an area of 200 square miles. Commenting on the appointment, the "Eastern Daily Press" said that whatever the responsibilities and duties attaching to the new appointment may be, the record of Mr. Campling at Yarmouth is guarantee enough that they will be fulfilled with ample energy and with supreme confidence in the future of electricity.

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We regret to record the death, which took place on August 8, of **Mr. John William Blakeborough,** of 39, Richmond Mount, Headingley, Leeds, who had been chief accountant in the Leeds Tramways Department for 15 years. Mr. Blakeborough was 50 years of age. His association with the Tramways and Transport Department in Leeds began in July, 1900, as a cashier. Later he went into the accountant's office under the late Mr. T. J. Hutton, whom he succeeded as chief accountant in January, 1915. During his career in Leeds he served under four general managers—Mr. W. Wharam, Mr. J. B. Hamilton, Mr. W. Chamberlain, and Mr. R. L. Horsfield, the present holder of the office. A genial personality, his popularity extended far beyond the city, being for a number of years auditor to the Municipal Tramways and Transport Association. He was regarded as an authority on finance in matters affecting tramways and transport, and was a contributor on these topics to the various tramways and municipal technical journals. He was also the author of a book entitled "A Practical Costing System Applied to Highway Administration." He leaves a widow and one son.

## CONTRACTS AND ORDERS.

**The L.C.C. Tramways** recently purchased one complete traction recording set at £155.

**Manchester Corporation** has placed an order with the Cargo Fleet Iron Co., Middlesbrough, for 2,000 tons of tramway rails.

**Leicester Tramways Committee** has accepted the tender of Dorman Long & Co., Ltd., at £2,131 5s. for the supply of tramway rails.

**Siemens Electric Lamps & Supplies, Ltd.,** have an order from the Metropolitan Water Board for gas-filled lamps for twelve months.

**Sheffield Electricity Committee** has accepted the tender of Bruce, Peebles & Co., Ltd., at £9,238, for the supply of three 500-KW. rectifier equipments for tramway supply purposes.

**Liverpool Tramways and Electricity Committee** has accepted the tender of the General Vehicle Co. for an electrically driven tower wagon at £956, and of Edgar Allen & Co., Ltd., for tramway special trackwork at £1,130.

**Glasgow Transport Committee** has recommended the acceptance of the following tenders for the supply each of 12 miles of copper trolley wire: Messrs. Felton Guilleaume, Germany, at £840; and I.C.C. Metals, Ltd., Birmingham, at £884 16s.

**The London Electric Railways** have placed a contract with Cochrane & Co., Ltd., of Middlesbrough, for 35,000 tons of cast-iron segments required for the extension of the Piccadilly tube from Finsbury Park to Cockfosters, a distance of 7½ miles.

**The British Aluminium Co., Ltd.,** has an order from the Sociedad Financiera de Industrias y Transportes Barcelona, acting for the Levante Light & Power Company of Spain, for aluminium steel-cored electric cable, and Mr. R. B. Holt, of 40, Grosvenor Gardens, London, S.W., has been retained to inspect and test.

**Southend-on-Sea Council** has accepted the following tenders:—English Electric Co., Ltd., for one pair of motors; British Thomson-Houston Co., Ltd., for one pair of controllers; General Electric Co., Ltd., one pair each of motors and controllers, and 250 KW. rotary converter and switchgear for Thorpe Bay sub-station.

**Dyer & Young, Ltd.,** of Stanstead, Essex, have received the following orders: Glasgow Corporation Transport, 500 armature coils; Manchester Corporation Tramways, controller fingers; Bradford Corporation, controller fingers; London County Council, armatures; Atlas Electrical & General Trust, Ltd., armature coils and controller spares.

**Hire of Bell Punches.**—When the renewal of a contract for punches with the Bell Punch & Printing Co., Ltd., came up for consideration by the Dover Tramways Committee, Councillor Morecroft suggested that they might buy punches outright. The contract was for the hire of 55 punches for five years. Mr. E. H. Bond, the tramways manager, explained that the department had had several other punches on trial, but these were not satisfactory. There was no undertaking as to repairs, and they cost £6 each. It was decided to renew the contract with the Bell Punch Company.

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# TRAFFIC RETURNS.

## Tramway and Omnibus Undertakings in the United Kingdom.

| NAME OF COMPANY OR CORPORATION | 1929. WEEKS ENDING | | | | | 1930. WEEKS ENDING | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | July 13 | July 20 | July 27 | Aug. 3 | ... | July 12 | July 19 | July 26 | Aug. 2 | ... | Wks. | 1930 | Increase or Decrease |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Aberdeen Corporation ... ... ... | 7,469 | 7,508 | 5,747 | 5,821 | ... | 5,483 | 6,128 | 7,004 | 6,422 | ... | 9½ | 55,294 | + 151 |
| Ashton-under-Lyne Corporation ... | 1,727 | 1,773 | 1,690 | 1,636 | ... | 1,567 | 1,622 | 1,588 | 1,601 | ... | 18 | 29,104 | — 1,488 |
| Ayr Corporation ... ... ... ... | 764 | 1,669 | 945 | 685 | ... | 665 | 734 | 1,426 | 835 | ... | 11 | 7,732 | — 662 |
| Barrow Corporation ... ... ... | 1,056 | 1,301 | 1,255 | 1,120 | ... | 1,026 | 1,058 | 1,078 | 1,150 | ... | 18 | 17,972 | + 158 |
| Belfast City ... ... ... ... | 12,902 | 10,982 | 11,037 | 11,378 | ... | 13,277 | 10,766 | 11,404 | 12,449 | ... | 17½ | 225,406 | + 12,637 |
| Birkenhead Corporation ... ... ... | 5,543 | 5,789 | 5,428 | 7,783 | ... | 5,397 | 5,066 | 5,375 | 5,710 | ... | 18 | 93,477 | — 493 |
| Birmingham Corporation ... ... | 41,657 | 42,297 | 41,169 | ... | ... | 42,605 | 39,912 | 41,331 | ... | ... | 17 | 729,246 | + 34,584 |
| Blackburn Corporation ... ... ... | 1,970 | 2,203 | 1,844 | 1,891 | ... | 2,177 | 2,241 | 1,967 | 2,101 | ... | 17¾ | 37,364 | + 3,183 |
| Bradford Corporation ... ... ... | 14,896 | 15,357 | 14,973 | 14,200 | ... | 14,501 | 15,342 | 14,201 | 14,003 | ... | 18 | 256,673 | — 10,933 |
| Brighton Corporation ... ... ... | 2,961 | 3,032 | 2,936 | 3,328 | ... | 3,014 | 2,841 | 2,949 | 3,381 | ... | 17¾ | 48,846 | + 2,133 |
| Burnley Corporation ... ... ... | 3,011 | 3,609 | 3,600 | 3,679 | ... | 3,014 | 3,529 | 3,413 | 3,434 | ... | ... | ... | ... |
| Burton-on-Trent Corporation ... ... | 813 | 871 | 1,103 | 882 | ... | 799 | 873 | 865 | 865 | ... | 18 | 15,240 | + 556 |
| Bury Corporation ... ... ... ... | 2,421 | 2,483 | 2,426 | 2,455 | ... | 2,928 | 2,900 | 2,948 | 2,965 | ... | 17¾ | 52,631 | + 8,008 |
| Cardiff Corporation ... ... ... | 7,922 | 7,862 | 7,736 | 7,502 | ... | 7,859 | 7,868 | 7,457 | 7,891 | ... | 17½ | 138,887 | + 2,978 |
| Chatham and District ... ... ... | 1,311 | 1,393 | 1,367 | 1,255 | ... | 1,353 | 1,226 | 1,174 | 1,237 | ... | 30 | 34,104 | + 1,036 |
| Chester Corporation ... ... ... | 453 | 456 | 429 | 436 | ... | 680 | 707 | 694 | 720 | ... | 18 | 11,893 | + 3,845 |
| Chesterfield Corporation ... ... ... | 1,839 | 1,862 | 1,847 | 2,221 | ... | 1,858 | 1,879 | 1,970 | 2,080 | ... | 18 | 33,859 | + 1,075 |
| Colchester Corporation ... ... ... | 630 | 566 | 570 | 730 | ... | 680 | 649 | 643 | 819 | ... | 19 | 11,544 | + 1,325 |
| Colne Corporation ... ... ... | 808 | 714 | 685 | 718 | ... | 692 | 657 | 723 | 708 | ... | 18 | 13,018 | — 84 |
| Coventry Corporation ... ... ... | 3,670 | 3,648 | 3,584 | 3,688 | ... | 3,704 | 3,674 | 3,836 | 3,778 | ... | 18 | 69,334 | + 2,349 |
| Darlington Corporation ... ... ... | 969 | 992 | 935 | 1,032 | ... | 1,073 | 1,089 | 1,052 | 1,095 | ... | 17½ | 19,025 | + 1,773 |
| Derby Corporation ... ... ... | 3,265 | 3,369 | 3,327 | 3,302 | ... | 3,361 | 3,368 | 3,390 | 3,311 | ... | 18 | 60,275 | + 3,110 |
| Dover Corporation ... ... ... | 443 | 495 | 479 | 486 | ... | 474 | 459 | 469 | 521 | ... | 18 | 7,419 | + 260 |
| Dundee City ... ... ... ... | 3,650 | 3,416 | 3,022 | ... | ... | 3,620 | 3,780 | 3,634 | ... | ... | 10½ | 39,263 | + 1,868 |
| East Ham Corporation ... ... ... | 2,234 | 2,281 | 2,248 | 2,221 | ... | 2,317 | 2,280 | 2,246 | 2,224 | ... | 17½ | 40,912 | + 788 |
| Edinburgh Corporation ... ... ... | 18,585 | 21,172 | 17,946 | 16,722 | ... | 19,506 | 17,648 | 19,663 | 19,097 | ... | 11½ | 222,862 | + 6,692 |
| Exeter Corporation ... ... ... | 911 | 1,072 | 1,077 | 1,157 | ... | 909 | 1,155 | 1,117 | 1,299 | ... | 19 | 20,944 | + 2,267 |
| Glasgow Corporation ... ... ... | 47,099 | 35,903 | 40 572 | 47,231 | ... | 51,490 | 49,503 | 32,065 | 44,368 | ... | 9 | 452,936 | + 29,876 |
| Gloucester Corporation ... ... ... | 578 | 606 | 571 | 539 | ... | 814 | 725 | 681 | 700 | ... | 17¾ | 12,261 | + 2,732 |
| Grimsby Corporation ... ... ... | 1,436 | 1,476 | 1,519 | 1,517 | ... | 1,637 | 1,620 | 1,612 | 1,727 | ... | 18 | 27,788 | + 3,444 |
| Halifax Corporation ... ... ... | 4,798 | 4,814 | 4,558 | 4,697 | ... | 5,277 | 5,121 | 5,233 | 5,321 | ... | 18½ | 94,910 | + 11,089 |
| Huddersfield Corporation ... ... | 6,429 | 6,591 | 6,353 | 6,232 | ... | 6,524 | 6,398 | 6,061 | 6,431 | ... | 18 | 114,709 | — 1,461 |
| Hull Corporation ... ... ... ... | 7,048 | 7,188 | 7,012 | 7,131 | ... | 7,110 | 7,745 | 7,163 | 7,240 | ... | 18 | 129,597 | + 2,185 |
| Ilford Corporation... ... ... ... | 1,462 | 1,477 | 1,455 | 1,416 | ... | 1,550 | 1,582 | 1,437 | 1,430 | ... | 17½ | 27,168 | + 601 |
| Ipswich Corporation Trolley Buses ... | 1,294 | 1,309 | 1,285 | 1,349 | ... | 1,326 | 1,383 | 1,372 | 1,418 | ... | 17½ | 23,870 | + 1,487 |
| Isle of Thanet ... ... ... ... | 1,488 | 1,718 | 1,882 | 1,944 | ... | 1,449 | 1,461 | 1,506 | 1,679 | ... | 30½ | 20,376 | — 1,429 |
| Kilmarnock Corporation ... ... ... | 475 | 496 | 491 | 481 | ... | 486 | 501 | 511 | 544 | ... | 11¾ | 5,680 | + 276 |
| Leeds Corporation... ... ... ... | 20,093 | 20,961 | 20,049 | 18,977 | ... | 20,818 | 20,751 | 19,571 | 19,645 | ... | 17½ | 359,706 | + 9,276 |
| Leicester Corporation ... ... ... | 8,572 | 8,614 | 8,671 | 8,586 | ... | 8,397 | 8,506 | 8,545 | 8,575 | ... | 18 | 150,743 | + 1,122 |
| Lincoln Corporation Buses ... ... | 1,007 | 957 | ... | ... | ... | 945 | 919 | ... | ... | ... | 16 | 14,840 | + 41 |
| Liverpool Corporation ... ... ... | 30,680 | 31,862 | 30,431 | 28,889 | ... | 30,627 | 29,815 | 28,826 | 29,961 | ... | 17¾ | 536,825 | + 3,330 |
| London County Council ... ... ... | 83,347 | 84,108 | 82,103 | 81,007 | ... | 83,585 | 81,835 | 80,421 | 80,300 | ... | 17¾ | 1,438,578 | — 6,902 |
| Luton Corporation ... ... ... | 402 | 446 | 441 | 414 | ... | 483 | 431 | 410 | 411 | ... | 17¾ | 7,552 | + 348 |
| Maidstone Corporation ... ... ... | 801 | 827 | 838 | 778 | ... | 873 | 853 | 852 | 867 | ... | 17¾ | 15,740 | + 1, 176 |
| Manchester Corporation ... ... ... | 41,560 | 41,769 | 40,473 | 37,431 | ... | 43,673 | 41,290 | 40,617 | 39,764 | ... | 18 | 731,728 | + 14,761 |
| Middlesbrough Corporation ... ... | 1,682 | 1,688 | 1,587 | ... | ... | 1,594 | 1,598 | 1,556 | ... | ... | 17½ | 27,968 | — 97 |
| Newcastle-on-Tyne Corporation ... | 11,967 | 12,510 | 12,270 | 12,048 | ... | 11,621 | 11,808 | 11,543 | 11,998 | ... | 17½ | 210,706 | — 4,284 |
| Newport Corporation ... ... ... | 2,444 | 2,464 | 2,441 | 2,430 | ... | 2,347 | 2,377 | 2,248 | 2,429 | ... | 18 | 43,046 | — 61 |
| Northampton Corporation ... ... | 1,790 | 1,786 | 1,745 | 1,867 | ... | 1,754 | 1,793 | 1,741 | 1,880 | ... | 17½ | 32,182 | + 957 |
| Nottingham Corporation ... ... | 9,656 | 9,826 | 9,627 | 9,251 | ... | 10,823 | 10,431 | 10,142 | 10,422 | ... | 17½ | 180,998 | + 15,210 |
| Oldham Corporation ... ... ... | 5,806 | 6,030 | 5,833 | 5,398 | ... | 5,288 | 5,272 | 5,150 | 5,369 | ... | 19 | 101,457 | — 5,749 |
| Plymouth Corporation ... ... ... | 5,994 | 6,718 | 6,145 | 5,649 | ... | 6,255 | 6,020 | 6,376 | 6,513 | ... | 17½ | 108,144 | + 7,190 |
| Portsmouth Corporation ... ... ... | 7,339 | 7,642 | 7,696 | 7,586 | ... | 8,453 | 8,308 | 7,966 | 9,258 | ... | 18 | 132,617 | + 18,096 |
| Preston Corporation ... ... ... | 2,266 | 2,346 | 2,293 | 2,368 | ... | 2,221 | 2,253 | 2,287 | 2,221 | ... | 17¾ | 38,024 | — 856 |
| Rawtenstall Corporation ... ... ... | 1,449 | 1,442 | 1,255 | 954 | ... | 1,384 | 1,393 | 1,269 | 932 | ... | 17½ | 24,110 | — 493 |
| Reading Corporation ... ... ... | 2,473 | 2,513 | 2,499 | 2,396 | ... | 2,474 | 2,439 | 2,272 | 2,417 | ... | 18 | 43,005 | + 819 |
| Rochdale Corporation ... ... ... | 4,793 | 4,883 | 4,742 | 4,581 | ... | 4,502 | 4,457 | 3,432 | 4,255 | ... | ... | 77,098 | — 3,932 |
| Rotherham Corporation ... ... ... | 2,608 | 2,611 | 2,640 | 2,810 | ... | 2,632 | 2,604 | 2,766 | 2,629 | ... | 18 | 49,585 | + 1,972 |
| Salford Corporation ... ... ... | 11,509 | 11,360 | 10,910 | 10,528 | ... | 11,304 | 10,758 | 11,045 | 10,511 | ... | 17¾ | 202,180 | + 2,569 |
| Sheffield Corporation ... ... ... | 20,970 | 21,659 | 20,936 | 20,271 | ... | 20 241 | 20,246 | 19,231 | 19,592 | ... | 17½ | 350,466 | — 3,993 |
| Southampton Corporation ... ... | 4,315 | 4,504 | 4,316 | 4,133 | ... | 4,479 | 4,544 | 4,253 | 4,493 | ... | 18 | 74,614 | + 2,808 |
| Southend-on-Sea Corporation ... ... | 2,939 | 2,968 | 2,923 | 4,272 | ... | 2,873 | 2,744 | 2,799 | 3,929 | ... | 18¾ | 46,488 | + 445 |
| Southport Corporation ... ... ... | 1,870 | 1,974 | 1,982 | 1,939 | ... | 1,989 | 1,905 | 1,945 | 2,033 | ... | 17½ | 31,780 | + 718 |
| St. Helens Corporation ... ... ... | 1,941 | 2,000 | 2,012 | 1,899 | ... | 2,067 | 2,032 | 2,066 | 2,010 | ... | 17 | 34,978 | + 2,281 |
| Sunderland Corporation ... ... ... | 3,078 | 3,173 | 2,919 | 3,248 | ... | 3,080 | 3,041 | 3,209 | 4,082 | ... | 18 | 56,054 | + 8,202 |
| Swindon Corporation ... ... ... | 679 | 868 | 856 | 823 | ... | 1,059 | 886 | 802 | 951 | ... | 17¾ | 16,888 | + 4,044 |
| Wallasey Corporation ... ... ... | 3,790 | 4,353 | 4,131 | 3,647 | ... | 4,020 | 3,774 | 3,687 | 4,124 | ... | 17½ | 64,979 | + 2,643 |
| Walsall Corporation ... ... ... | 3,325 | 3,271 | 2,373 | 3,428 | ... | 3,214 | 3,154 | 2,412 | 3,447 | ... | 18 | 62,125 | + 1,531 |
| Walthamstow Corporation ... ... | 2,549 | 2,588 | 2,505 | 2,397 | ... | 2,571 | 2,493 | 2,391 | 2,445 | ... | 17½ | 44,422 | + 141 |
| Warrington Corporation ... ... ... | 1,278 | 1,288 | 1,290 | 1,288 | ... | 1,321 | 1,330 | 1,392 | 1,347 | ... | 18 | 24,913 | + 1,140 |
| West Ham Corporation ... ... ... | 5,909 | 5,926 | 5,830 | 5,800 | ... | 6,047 | 5,900 | 5,816 | 5,805 | ... | 17¾ | 106,843 | + 2,539 |
| Wolverhampton Corporation ... ... | 6,007 | 6,359 | 5,840 | 6,059 | ... | 5,730 | 5,733 | 5,667 | 5,911 | ... | 18 | 107,107 | — 2,820 |
| York Corporation ... ... ... ... | 1,806 | 1,981 | 1,416 | 1,535 | ... | 1,595 | 1,590 | 1,513 | 1,608 | ... | 19 | 28,748 | + 1,479 |

## Underground Electric Railways Company of London, Limited.

| NAME OF COMPANY | 1929. WEEKS ENDING | | | | | 1930. WEEKS ENDING | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | July 13 | July 20 | July 27 | Aug. 3 | ... | July 12 | July 19 | July 26 | Aug. 2 | ... | Wks. | 1930 | Increase or Decrease |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Underground Rlys. (Common Fund Co.) | 308,600 | 303,600 | 297,900 | 279,700 | ... | 317,700 | 307,000 | 294,300 | 300,000 | ... | 31 | 9,358,400 | + 590,000 |
| London and Suburban District ... ... | 45,800 | 45,900 | 44,700 | 42,100 | ... | 47,300 | 45,900 | 43,500 | 44,500 | ... | 31 | 1,367,100 | + 99,100 |

## Colonial and Foreign Tramway Traffic Returns.

| NAME OF COMPANY OR CORPORATION | 1929. WEEKS ENDING | | | | | 1930. WEEKS ENDING | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | July 13 | July 20 | July 27 | Aug. 3 | ... | July 12 | July 19 | July 26 | Aug. 2 | ... | Wks. | 1930 | Increase or Decrease |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Anglo-Argentine ... ... ... ... | 77,165 | 81,437 | 80,238 | 84,394 | ... | 74,699 | 74,314 | 76,670 | 79,200 | ... | 31 | 2,577,341 | — 105,433 |
| Buenos Aires Lacroze ... ... ... | 11,027 | 11,495 | 11,148 | 11,292 | ... | 10,011 | 9,603 | 10,825 | 10,738 | ... | 5 | 51,188 | — 5,599 |
| Calcutta ... ... ... *Rupees* | 126,332 | 128,680 | 122,907 | 123,395 | ... | 98,491 | 103,723 | 103,270 | 104,921 | ... | 30½ | 3,438,583 | — 465,573 |
| Madras (2 weeks) ... ... *Rupees* | 50,308 | ... | 42,239 | ... | ... | 52,435 | ... | 45,091 | ... | ... | 30 | 646,057 | + 33,452 |

| | 1929. | | | | | | 1930. | | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Feb. | Mar. | April | May | June | July | Feb. | Mar. | April | May | June | July | Mths. | 1930 | Increase or Decrease |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Brazilian Trac. $ | 3,755,709 | 3,928,550 | 4,042,145 | 4,206,895 | 4,210,893 | ... | 3,798,698 | 4,047,036 | 4,127,492 | 4,304,160 | 4,146,884 | ... | 6 | 24,286,359 | + 249,334 |
| British Columbia $ | 1,192,871 | 1,243,592 | 1,205,482 | 1,165,279 | 1,133,017 | ... | 1,246,551 | 1,258,375 | 1,213,993 | 1,203,292 | 1,144,585 | ... | 12 | 14,658,732 | + 610,870 |
| Burma ... Rs. | 63,808 | 68,993 | 64,744 | 66,077 | 63,157 | ... | 63,098 | 72,758 | 65,482 | 66,320 | 66,317 | ... | 11 | 3,438,583 | — 465,573 |
| Cape Town ... | 28,274 | 30,121 | 29,244 | 29,366 | 27,995 | ... | 27,479 | 30,087 | 27,500 | 27,286 | 25,525 | ... | ... | ... | ... |
| Carthagena & H.... | 972 | 853 | 1,063 | 725 | 1,476 | 1,100 | 1,286 | 1,003 | 905 | 552 | 515 | 738 | 7 | 6,350 | — 571 |
| Durban ... ... | 21,848 | 24,442 | 25,603 | 24,518 | 24,308 | ... | 21,321 | 23,662 | 24,002 | 23,945 | 23,440 | ... | 11 | 261,923 | — 1,582 |
| East India ... | 3,055 | 3,892 | 3,798 | 3,862 | 3,772 | 3,801 | 3,127 | 3,863 | 3,601 | 3,698 | 3,803 | 3,833 | 12 | 45,460 | + 470 |
| Kalgoorlie... ... | 1,433 | 1,682 | 1,673 | 1,747 | 1,660 | ... | 1,437 | 1,710 | 1,718 | ... | ... | ... | 4 | 6,319 | Nil |
| Para ... ... | 14,007 | 14,971 | 15,060 | 15,182 | 15,450 | ... | 13,628 | 14,976 | 15,564 | 15,568 | 15,028 | ... | 7 | 103,807 | + 749 |
| Port Elizabeth ... | 7,478 | 7,857 | 7,877 | 7,601 | 7,335 | ... | 7,110 | 8,127 | 7,521 | 7,552 | 6,951 | ... | ... | ... | ... |
| Rangoon ... Rs. | 114,300 | 121,246 | 120,855 | 121,040 | 114,535 | 122,630 | 140,130 | 164,600 | 148,215 | 149,440 | 142,170 | 151,300 | 7 | 1,050,935 | + 219,494 |
| Shanghai ... $ | 294,708 | 339,785 | 336,624 | 339,833 | 335,740 | ... | 322,473 | 377,849 | 308,840 | 183,409 | 367,231 | 145,000 | 7 | 1,368,000 | + 154,000 |
| Singapore $ | 117,000 | 133,000 | 131,000 | 133,000 | 123,000 | 131,000 | 128,000 | 143,000 | 137,000 | 148,000 | 140,000 | ... | 9 | 1,223,000 | + 140,000 |
| Winnipeg ... $ | 570,895 | 572,492 | 536,033 | 534,954 | 517,738 | ... | 567,569 | 571,157 | 516,132 | 509,709 | 479,958 | ... | 6 | 3,273,504 | — 66,574 |

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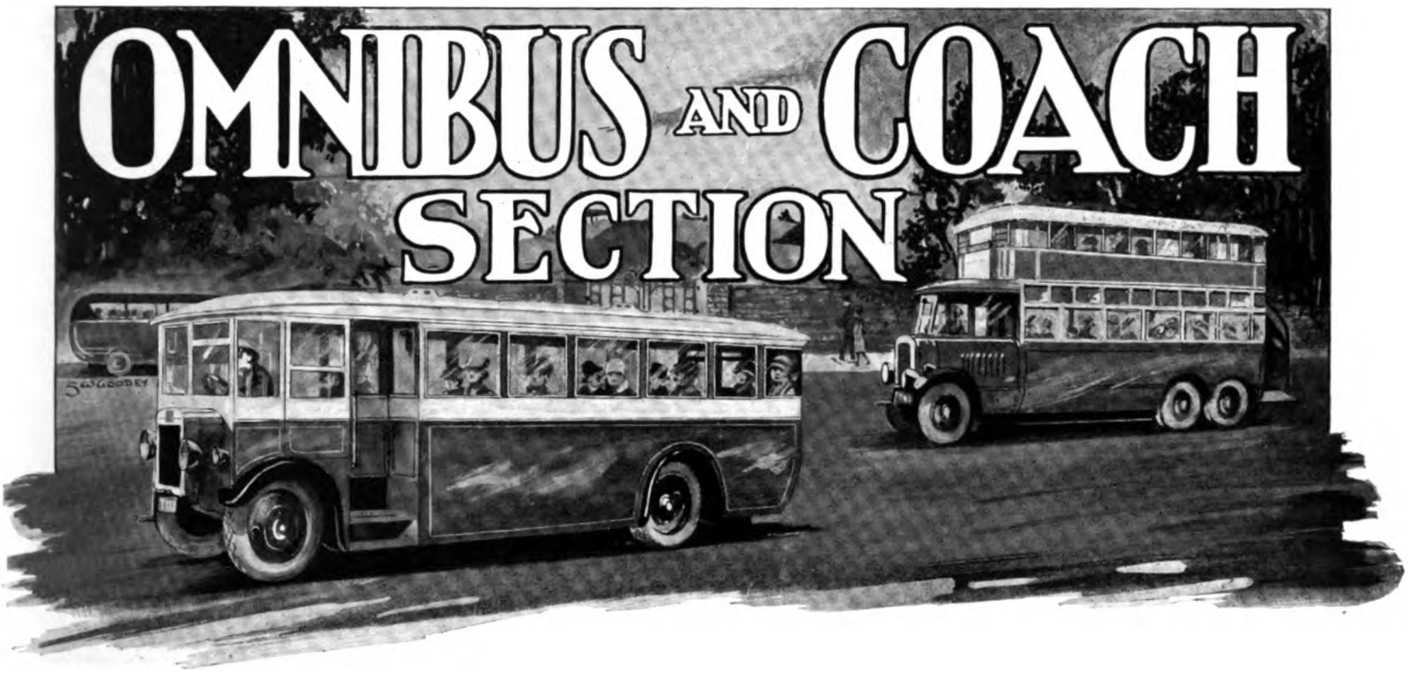


**OMNIBUS AND COACH SECTION—TWENTY-FIFTH YEAR OF PUBLICATION.**

### THE DIESEL BUS.

With the lively interest now being taken in the Diesel engine for transport operation a recent experience in riding in an omnibus so equipped merits a few comments upon an important development. The vehicle was a single-deck omnibus on a chassis that had seen better days and was operating on a fifteen-mile route in an industrial area. It was particularly interesting to observe the starting up of the engine from cold, and the observer can vouch for the immediate firing of the engine by means of the self-starter. The acceleration of the omnibus through the usual gear changes was equal, if not superior, to the petrol type, and no difference was noted in flexibility under throttle movement, which has been urged against the Diesel for traffic conditions. At a speed of about thirty miles per hour the engine was turning over without fuss, and the observers had a feeling that any gradients that would normally cause a change down in the petrol type would be surmounted in top gear without difficulty. This proved to be the case. It is doubtful whether any of the passengers were aware of anything unusual. Certainly they appeared unconscious of the novelty in passenger transport beneath the bonnet. Those bugbears of acrid fumes and oily exhaust were noticeable by their absence; thus another obstacle has been surmounted. When idling, the engine was heard to give that characteristic thump—noticeable, however, only to the initiated. With fuel at 4½d. per gallon this omnibus has been making history on that route at all events. With a mileage of over 14,000 miles it has, for an experimental unit, made praiseworthy efforts to keep in service full time. That this is not wholly achieved is merely stimulating the British makers to still further efforts towards Diesel engine perfection. Minor troubles still remain to be surmounted, but their solution may be left to the engineering skill that has developed the petrol engine to a point of efficiency where improvement is difficult. The goal of low cost fuel with absence of fire hazard is an accomplished fact in passenger transport. Further improvement, however, can only be effected when the engine has been specially designed for the fuel used. Conversion of petrol engines for the lower grade fuel is not likely to afford a solution, because of mechanical reasons of higher compression and temperatures which form the essential elements of the Diesel principle.

### WORKMEN'S FARES ON OMNIBUSES.

The question of cheap fares for workmen is of serious importance to operators in industrial areas. This is particularly so where omnibus services have been substituted for tramways. In the Acts authorising the construction of the tramways, a legal obligation was placed upon operators to carry workmen at low fares; and in the majority of cases these fares involved a considerable annual loss on the undertaking. As the working day of the artisan extended over a much longer period than at the present time, and his wages were very much lower, much could, and was, said in favour of the obligation, in spite of the loss entailed. The bulk of the workmen were carried at a time in the morning when no other traffic was available and special workmen's cars could be run for the purpose. Even in the evening it was possible in many cases to handle the bulk of the workmen traffic by special cars. Now, however, as the shorter day is universal, the peak load presents much greater difficulties. With the advent of the omnibus on routes hitherto covered by tramways, workmen expect to travel at the same low fares, and as many of them have been induced by the small cost of travelling to their work to leave crowded areas and live on the outskirts of the towns, there is some justice in their claims for the continuance of special fares. On the other hand, there is no question of the soundness of the policy that all should pay the value of the services received; and as the average workman is now in receipt of an income equal, and in many cases superior, to that of the general user of public service vehicles, there appears to be little sound argument in favour of a preferential fare for a section of the public, whose chief claim is based upon the fact that he travels one way before a certain hour in the morning. The ideal

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# OMNIBUS AND COACH SECTION

system of fares is that which gives the lowest possible fare permitted by the all-in cost of the service. Consequently any loss incurred in transporting one section of the public must be taken into consideration when fixing fares for the rest. With the more rapid depreciation of the omnibus and its generally smaller carrying capacity, the obligation of the uneconomic workmen's fares, which has always been a handicap on the tramway systems, will inevitably be felt to a much greater degree on the omnibus routes. With the change of system there is thus sound reason for reconsidering the whole question of workmen's fares.

## THE ROAD TRAFFIC ACT AT LAST.

After Parliamentary discussions extending at intervals over many months, the much desired and much needed Road Traffic Bill is the Road Traffic Act at last. It is in no sense a party political measure; the foundations of it, indeed, were laid in the draft Bill which was prepared by the late Government, which was circulated for opinion and criticism, but which was never brought before Parliament. Probably it was because the need for such a measure to regulate and control road motor traffic was ever becoming more acute that the present Government undertook to find the time and energy to push their Bill through. It is a long Act, a complicated Act, and an Act representing the results of prolonged negotiations between both private and public automobile interests on the one hand and the Ministry of Transport, local authorities, the police, railway companies, and so forth on the other. Because of the multiplicity of the Act's provisions, relating to so many matters, it was inevitable that there should be much Parliamentary discussion. Latterly, when there were differences of opinion on various points between the two Houses, the Bill was a sort of football bandied about between one and the other. So at last by compromises and concessions the thing was done. A further problem now arises—a problem for the owners, operators, and employees of all motor vehicles, whether of the private or the public sort. The Act is about to be published in its final form, and the problem for all concerned is within the shortest possible time to make themselves masters of its contents. Different parts of it are to come into force at different dates during the next few months. Many new offences are created, and in addition the Minister of Transport is empowered to make hosts of regulations which, when made, have to be confirmed by Parliament. Doubtless it will take time to get such a complicated machine into proper working order. Everyone concerned will hope that the scheme will be beneficial; it is comprehensive, and if defects in detail are discovered they can be remedied.

### Public Service Vehicles.

Large parts of the Act are applicable mainly to private cars and to heavy goods vehicles, but, even allowing for that, there is plenty of matter for study by the owners and operators of omnibuses and coaches. For example, take the appointment and duties of the area licensing commissioners, the abolition of the licensing powers of local authorities, licences for the vehicles, licences for their particular services, licences for the drivers and conductors, inspection of vehicles, insurance, detail provisions, which at first sight seem almost innumerable, and so on and so on. Evidently omnibuses and coaches will no longer be allowed to roam about the country at the sweet will of the owners and of local authorities. Every service is to be separately licensed by the commissioners, who in considering applications will see to it that there is no useless competition. In that connection it should be noted that part of the Act does not apply to the Metropolitan area, which is under the London Traffic Act; at the same time many of the provisions do so apply. For example, there is the question of the rapid multiplication in the number of huge motor coaches coming into London from the country and *vice versa*. The restriction on the number of omnibuses (under the London Traffic Act) does not apply to these coaches; they do not ply for hire in London. The present position in regard to them was made clear by Mr. Morrison, the Minister of Transport, by an answer to a recent question in the House of Commons. He said that there was no information available as to the number of motor coaches which entered the centre of London daily. There was no direct control of these vehicles when in the Metropolitan Police District as regards either their number or the streets which they must traverse. They would, however, be controlled in these respects when the Road Traffic Bill came into operation. That statement may be supplemented by saying that the traffic area commissioner for London has, under the Act, the same powers as the traffic area commissioners for other districts (subject to the provisions of the London Traffic Act) and that the commissioner will act in conjunction with the Minister of Transport and the London Traffic Advisory Committee. So the "chartered libertine" days of the motor coach in London appear to be numbered.

### Municipal Omnibuses.

That old friend, the Omnibuses Bill, urged on Parliament unsuccessfully by the Municipal Tramways and Transport Association for several years, has at last attained immortality. Its provisions are substantially included in the Road Traffic Act. It enables municipalities which already possess transport powers to extend their omnibus services inside their areas, and also, with the consent of the traffic commissioners, outside of these areas without having to incur the labour and expense of obtaining Acts of Parliament for the purpose. That puts transport owning local authorities in the same position as companies in the matter of extending omnibus services. This power to municipalities was contained in the Bill as originally introduced in the House of Lords, but their Lordships threw it out on the ground that it unduly encouraged municipal trading. The Commons, however, stood firm and reinserted it with some modifications and the Lords then accepted it. The provision does not apply to the London traffic area. The last struggle in the bandying of amendments between the two Houses was on the

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# OMNIBUS AND COACH SECTION

point whether a "fair wages clause" for employees should remain in the Bill. The Lords objected, but finally they assented. This principle, new as applied to private enterprise, is no doubt capable of dangerous extension in other directions. It seems to have grown out of complaints that drivers and conductors were, in some cases, being worked long hours at too low wages. As to hours of work, the Act regulates them for the purpose of public safety.

THE MINISTER OF TRANSPORT.

Mr. Herbert Morrison, the Minister of Transport, is to be congratulated on having steered his ship with its multitudinous wares safely into port. It was a long voyage and there were occasional rocks and shoals. Mr. Morrison is a Socialist in politics, but in the main there is nothing very Socialistic about the Act. It is a business matter. No doubt Mr. Morrison's experience as a prominent member of the London County Council was of help to him in dealing with the numerous amendments which were moved in the Standing Committee of the House of Commons on the Bill. He has a grasp of affairs and he has a grasp of detail. He knows when to make concessions and he knows when to stand firm. The office of Minister of Transport is one of those blessed ones which is largely free from party politics, and Mr. Morrison upheld its reputation. For many a day he had to champion his Bill in the Standing Committee, and though progress was sometimes slow he won out in the end. Lieut.-Col. Ashley, who was Minister of Transport in the last Government, although a keen critic on some details, as the father of the original draft Bill felt a friendly interest in the measure, and as time went on was a helpful factor in smoothing out difficulties. Apart from any amendments which experience may prove to be necessary, the Act should meet the needs of motor traffic for a long time. The general public will also, before long, recognise the safeguards which it provides for them.

## PASSENGER TRANSPORT PROBLEMS.

The growing volume of opinion that all forms of passenger transport shall be considered, not upon their individual merit, but upon their relative degree of usefulness in a general scheme of travelling facilities, demands the closest attention of all concerned in this vital industry. Evidence that the officers of the London Underground Group are carefully studying the present position is given by the opinion expressed in the admirable paper recently submitted to the American Electric Railway Convention at San Francisco by Mr. G. J. Shave, the operating manager and chief engineer of the London General Omnibus Company. Although speaking as an omnibus operator and admitting a prejudice against other forms of transport, particularly those operating on rails, Mr. Shave dealt fairly with the advantages and disadvantages of each system in a concise manner, and endeavoured to show that as the growth of population and of road traffic has overtaken the existing forms of travelling facilities available, not only in the larger cities, but in innumerable small towns, every encouragement should be given to new lines of research. Dealing first with the transport question generally, Mr. Shave said that in his opinion the British main line railways had lost about ten years of opportunity; for it was only during the past two or three years that those responsible for their administration had come to realise that road transport was severely cutting into their traffics. That this is so, all competent observers must agree; and the "take-it-or-leave-it" policy which dominated the railways for so many years did much to pave the way for the road motor services which have now become so firmly established. Speaking of the passenger motor coach as a cheaper, more comfortable, and in many cases speedier means of transport than the railway, it is of interest to note that in Mr. Shave's opinion this only holds good for distances up to about one hundred miles. In dealing with urban passenger transport Mr. Shave does not think even with electrification and a closer study of signalling efficiency the railways will be able to do much towards solving the traffic problem, as the impossibility of extending or duplicating track and the "bottlenecks" which exist at various points will set a definite limit to their development. Underground systems in his opinion offer the greatest possibilities for dealing with the traffic between the city and the suburbs, and in spite of the heavy capital expenditure required for their construction will ultimately prove the biggest factor in the solution of the congestion problem in most of the large cities. Dealing with the surface facilities, Mr. Shave is of the opinion that the vehicles must be capable of high average speed and must offer a high degree of comfort, as the public is becoming more exacting in its demands. He agreed that these facilities are equally obtainable in either type of vehicle and that it was largely a matter of circumstance when considering their superiority. Mr. Shave's admitted prejudice against the tramways was shown in his statement that "had it not been for the passing of an Act of Parliament restricting omnibus services over tramway routes thus forcing the public to patronise tramcars, all the tramway undertakings in London would by now have become bankrupt." Possibly it was the recollection of this statement that caused him to say that many would disagree with his views. His opinion that the trolleybus is an expedient "and largely of a transitory nature" would also find many opponents.

Passing to the motor omnibus, Mr. Shave gave a large amount of information of much value to all interested in the running of urban services. His wide experience and intimate knowledge of the subject from the operating as well as the maintenance side, gives him special authority as an expert. His remarks as to the possibilities of the heavy-oil compression ignition engine are of special interest as it is well known that he has closely watched the progress that has been made with its development in this country. Altogether Mr. Shave is to be congratulated upon his paper and also upon his enterprise in presenting it before so distinguished a body so far from his sphere of operations.

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# OMNIBUS AND COACH SECTION

## KARRIER "MONITOR" FOUR-WHEEL OMNIBUS.

65-110 B.H.P. Low-Loading Model for 48–50 Passengers.

To their range of four and six-wheel omnibuses and coaches, seating from 20 to 68 passengers, Karrier Motors, Ltd., of Huddersfield, have added a four-wheel chassis which will accommodate a body seating from 48 to 50 persons. It has been designed to take a top-covered double-deck body, and to allow of the provision of adequate room for each seat. Many operators prefer the four-wheeler when considering the conveyance of a medium number of passengers, and it is for this class that the "Monitor" has been designed.

Operators will be interested to learn that the important question of appearance, as apart from mechanical perfection, has received due consideration. For instance, the design of the chromium-plated gilled tube radiator is a great improvement on the older type of radiator, and the result is that the lines of the new machine conform pleasingly with modern examples of coach-building art. The top and bottom tanks of the radiator are detachable.

A well-proportioned frame forms the basis of the chassis. Pressed steel side-channels tapering, both in plan and elevation, form a structure calculated to withstand varying types of load. The maximum dimensions are 10 in. by 5 in., and each side member is upswept over the rear axle and dropped at rear to a low level for the loading platform. The frame is braced by tubular cross-members to ensure torsional rigidity, and the engine is carried in a three-point suspended sub-frame.

The leading particulars of the chassis are as follow :—

| | |
|---|---|
| Engine ... ... ... ... ... ... | 75–122 max. H.P. (power setting) |
| Bore ... ... ... ... ... ... | 100 mm. (3 1/16 in. approx.) |
| Stroke ... ... ... ... ... ... | 140 mm. (5 1/2 in. approx.) |
| Wheel-base ... ... ... ... ... | 16 ft. 3 in. |
| Body space ... ... ... ... ... | 21 ft. 3 in. |
| Wheel track ... ... ... ... ... | Front—6 ft. 4 7/8 in.<br>Rear—5 ft. 10 1/2 in. |
| Turning circle ... ... ... ... ... | 58 ft. |
| Overall length ... ... ... ... ... | 26 ft. |
| Overall width ... ... ... ... ... | 7 ft. 6 in. |
| Frame width at rear ... ... ... ... | 3 ft. 11 in. |
| Height of frame (loaded) ... ... ... | 2 ft. 1 in. |
| Platform support height ... ... ... | 13 in. |
| Ground clearance for a distance of 14 ft. 6 in. from front of chassis ... ... ... | 11 in. |
| Rear axle clearance ... ... ... ... | 7 in. |
| Chassis weight ... ... ... ... ... | 3 tons 10 cwt. |

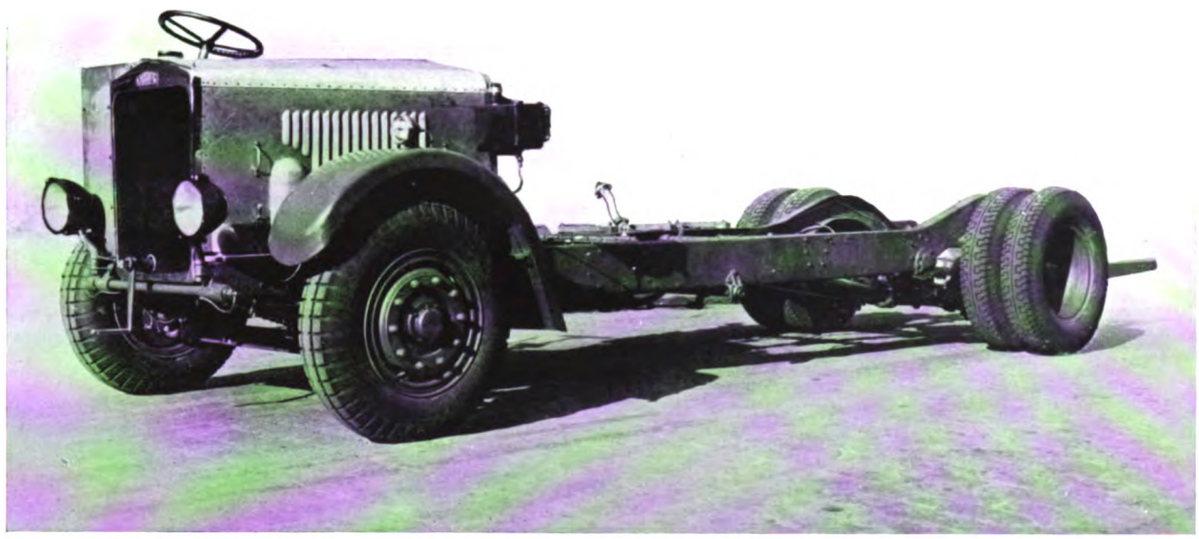
With the engine registering 1,250 R.P.M. the gear ratios and speeds are as follow :—

| | | | |
|---|---|---|---|
| Fourth ... ... ... ... ... ... ... | 6·25 to 1 | — | 22·3 M.P.H. |
| Third ... ... ... ... ... ... ... | 10·78 to 1 | — | 12·9 ,, |
| Second... ... ... ... ... ... ... | 17·95 to 1 | — | 7·75 ,, |
| First ... ... ... ... ... ... ... | 31·0 to 1 | — | 4·5 ,, |
| Reverse ... ... ... ... ... ... | 40·12 to 1 | — | 3·47 ,, |

The engine is the new six-cylinder Karrier product which was illustrated and described in these columns on April 17 last. It is designed on orthodox lines and embodies few new mechanical principles, the necessary precautions to ensure good service, apart from overhaul and periodic inspection being such as are commonly known. It gives remarkably smooth and flexible working within its range of 65-110 B.H.P., and the makers record that under actual service conditions (fully loaded) the engine has petrol and oil consumptions of 8 and 1,200 M.P.G. respectively.

The six cylinders are of monobloc type, amply water-jacketed and fitted with a highly efficient detachable head. Valves of the side-by-side type, have automatically-lubricated stems. Inlets are of nickel, and the exhausts of stainless steel. Adjustable tappets are enclosed by dust-proof aluminium covers, quickly detachable.

The pistons are of Heposil alloy, ground to size and fitted with three rings. Gudgeon pins—fully-floating type—are of case-hardened steel, extra large in diameter. The connecting rods are of high tensile steel stampings. The big ends—white metal lined—are of special design ensuring absolute rigidity of bearing. The crank-case is of cast aluminium, mounted on a three-point suspended sub-frame, the bottom half forming the sump. The nickel-steel drop forging crankshaft is accurately machined, heat-treated and ground. It has four main bearings and is fitted with a torsional vibration damper. The camshaft is of case-hardened steel, machined from solid and supported in four large bearings.



Front near side of the "Monitor" Omnibus Chassis with improved Radiator.

The drive is taken through a combined cone and plate to the four-speed gear-box. The clutch is fabric lined, adjustable and totally enclosed. This arrangement couples the smooth pick-up of a plate clutch with the powerful grip of the cone when fully engaged, and greatly facilitates gear changing. An efficient clutch stop is also incorporated. The "ball and gate" type change-speed gear has left-hand control. The gears are positively locked in position by spring-loaded plungers operating on selector rods in the gear-box, and a reverse stop is fitted to the gear quadrant. Formed of a one-piece electron casting, the gear-box is extremely well ribbed, internally and externally, to reduce drumming. Robust gear-shafts, located side by side, carry large diameter gear-wheels, the widths of which have been arranged to give a uniform tooth pressure for each ratio, with a result that long life and quiet running have been achieved. All gear teeth are, of course, ground after hardening.

Final transmission is by a divided tubular propellor shaft and metal universal joints, the centre support bearing being of the self-aligning ball-journal type housed in a massive tubular chassis cross-member. An inverted worm-driven rear axle, having

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# OMNIBUS AND COACH SECTION

extremely robust proportions, is used, and it has as its base, a solid stamped steel banjo with the diameter placed in a horizontal plane. The driving shafts—integral with the hub caps and of the fully-floating type—are relieved of all loads, save that of transmitting the drive, and can be withdrawn whilst the vehicle remains on its wheels.

Easy riding comfort is ensured by the employment of long, flat semi-elliptic springs, 5 ft. long at the rear and 3 ft. 6 in. long at the front. A notable feature of the suspension lay-out is the angle

Upswept Frame over Inverted Worm Driven near Axle.

each spring makes with the horizontal, the forward end being slightly higher than the rear in each case. The rear springs are mounted under the frame side-members, but the front are offset and have their forward ends mounted on the front cross-tube of the chassis, shackles in tension at the rear end being necessitated by the low frame height.

Brakes, both hand and foot, operate on the road wheels, which are of the detachable steel disc type, carrying 40 in. by 9 in. twin balloons at the rear and 36 in. by 8 in. singles at front. The foot brake, which is servo-assisted, operates on all four wheels, whilst the hand brake acts on the rear wheels only. The rod lay-out of the braking system possesses a minimum of relays, and the one brake cross shaft is of large diameter and is mounted in spherical bearings. This, together with the fact that no cranked levers are necessary, gives a rigid braking system in which all lost motion is eliminated. Rear brake drums have an effective diameter of 20 in., shoes being 3⅜ in. wide, whilst the front wheel drums are 17 in. dia. with 3 in. wide shoes.

It should be noted that the front axle is a high tensile drop forging of "H" section between the spring seats, merging into a round section outwards from the spring seats, to resist the stresses set up by the torsional forces due to braking. Taper roller bearings are used for the hubs. A taper roller bearing is used to take the thrust on the swivel pin.

Steering is of the worm and sector type of suitable ratio, and in conjunction with the large hand-wheel—approximately 20 in. dia.—enables abrupt angular turns to be taken with ease. Noticeable features of the front axle design are the widely-spaced springs, short track-rod, inclined pivot pins and centre-point steering, all of which influence the performance of the chassis on the road.

Chassis lubrication is by the Alcyl centralised system. The 43-gallon petrol tank is fitted with a magnetic gauge, and has autovac feed having a capacity of two gallons.

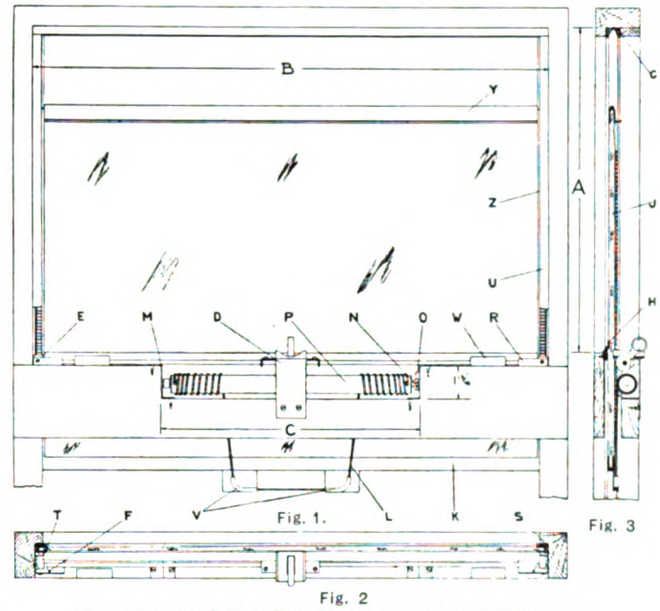
## MOTOR VEHICLES IN AUSTRALIA.

Statistics of motor vehicles registered in the States of Australia during April, 1930, were as follows :—

| | *Motor Cars.* | *Commercial Vehicles.* |
|---|---|---|
| New South Wales .. .. .. | 1,105 | 407 |
| Queensland .. .. .. .. | 427 | 175 |
| South Australia .. .. .. .. | 228 | 75 |
| Tasmania .. .. .. .. .. | 74 | 41 |
| Victoria .. .. .. .. .. | 801 | 285 |
| Western Australia (Perth Metropolitan Area only) .. .. .. .. | 70 | 22 |

## RAWLINGS' IMPROVED ROD-TYPE WINDOW LIFT.

The rod-type spring-balanced window lift which the Rawlings Manufacturing Co., Ltd., of Larch Road, London, S.W., placed upon the market some time ago, has become deservedly popular with the travelling public, as well as the operators of public service vehicles. An improvement, which Messrs. Rawlings consider to be of great importance, has now been incorporated in the design of this fitting, which will still further enhance its value and usefulness. In the original design rubber blocks pressing against the glass was the means employed for holding the window in position. In the improved type a very light corrugated section is mounted on the channels glazed to the glass and the movement of the window is definitely controlled by a specially-constructed spring which enters the recesses of the corrugation. It will be seen, therefore, that there can be no "creeping" and that the window can be fixed in any position and remain so unless deliberately altered by the passenger. The main principle of the lifting gear is the same as in the rubber block type, the details of which, together with the new corrugated section, will be seen from the fitting instructions drawings which are reproduced herewith. Fig. 1 is a view of the general lay-out of the window, complete with the improved type of fitting. Fig. 2 shows the velvet-covered rubber channel, cams and locking screw, while Fig. 3 gives an end view of the window with the locking




Drawings of the Rawlings Improved Window.

A —Depth from base of cant rail boxing to top of waist rail.
B —Width between bases of boxing out in pillars.
C —Required cut out in garnish rail.
D —Lever control bracket.
E —Cam adjustment screw.
F —Lock screw.
G —Rubber silencer channel.
H —Fence plate.
J —Drop light.
K —Lifting channel.
L —Lifting cable (phosphor bronze).
M—Roller Brackets.
N —Ratchet.
O —Pawl.
P —Roller.
R —Spring brackets.
S —Velvet covered rubber runs.
T —Cams.
U —Removable side fillets
V —Lifting channel cable brackets.
W—Wood packings.
X —Rack springs.
Y —Top channels.
Z —Side channels.

lever and lifting roller. It is of interest to note that the new rod-type window lift can be supplied with lift rollers of four different lengths in order to raise windows of various weights ranging from 9 lb. to 30 lb. Messrs. Rawlings inform us that there is already a most gratifying demand for the fittings.

## THE ROYAL ASSENT.

Among the Acts which received the Royal Assent on 1 August were the following: St. Helens Corporation (Trolley Vehicles) Provisional Order Act, 1930; Wolverhampton Corporation (Trolley Vehicles) Provisional Order Act, 1930; Bradford Corporation (Trolley Vehicles) Order Confirmation Act, 1930; Bradford Corporation (Trolley Vehicles) Provisional Order Act, 1930; and London United Tramways Act, 1930.

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# OMNIBUS AND COACH SECTION

## LONDON OMNIBUSES AND OTHER FORMS OF PASSENGER TRANSPORT.

By G. J. Shave.
*Operating Manager and Chief Engineer of the London General Omnibus Co., Ltd.*

In our issue of July 17, it was possible to make only a brief reference to the important paper that Mr. G. J. Shave submitted to the engineering section of the American Electric Railway Convention in San Francisco on June 23 last. As many of the points raised and opinions expressed are of outstanding interest to all concerned in passenger transport, abstracts from the paper are given below.

In submitting this paper, it must be appreciated that I speak as an omnibus man, with an unfortunate prejudice against other forms of transport, particularly that operating on rails. No doubt many here will entirely disagree with my views.

The problem of passenger transportation in the large and highly populated cities of the world to-day has developed into one of such proportions and urgency, that those responsible for the well-being and business economy of the communities involved, are becoming deeply concerned as to what the future holds in store in so far as urban travelling facilities are concerned. The problem is not now confined merely to the larger cities in the various civilised countries but has to be faced alike by the innumerable smaller towns wherein the growth of population and of road traffic has overtaken and choked the existing forms of travelling facilities available. It is a problem, therefore, of universal moment, but it is not, unfortunately, one for which a universally applicable solution can be offered; the many differences in local conditions render this impracticable.

Whereas, therefore, it is not possible to generalise upon many aspects of the subject, the experience gained by those engaged in solving the problem as it affects their own particular set of circumstances, should nevertheless prove of interest and assistance to their fellow students of the art of traffic administration, and it is in the hope that this may be so that the following brief reference to the study of passenger transportation in England is presented.

Dealing first of all with the transport question generally, the undeniable fact is that the British Main Line Railways have lost what I estimate to be about ten years of opportunity. It is only within the past two or three years that those responsible for the railway administration have come to realise that road transport has been severely cutting in to their traffics, both in respect of passengers and goods, and that well organised road transport can offer reliable and efficient service which is attractive both to the travelling public and to industry. Most of the appeals for improvement failed to bear fruit, and as a natural consequence of this, the transport by road, both of passengers and goods, has steadily increased until now, so far as passenger travel is concerned, the motor coach has become firmly established as a cheaper, more comfortable, and in many cases speedier means of transport than the railway. This may be said to hold good for distances up to about 100 miles.

The railways now realise their true position, and in an endeavour to recover their lost prestige, are, at considerable cost and with no little advantage to the coach undertakings, negotiating mergers or purchases of such undertakings in order that the scourge of competition from which they have been suffering may be relaxed. So far as the goods carrying business is concerned, however, I feel that what the railways have lost they can never fully recover. The principal reason for this is that the customers have come to realise the several important advantages attaching to the single handling of goods from door to door, an attraction the railways are unable to offer.

The foregoing serves as a brief survey of the inter-urban transport situation in England to-day, from which it will be gathered that this aspect of the problem still remains in a state of flux, and is, as yet, some distance from the point of stabilisation. I will now pass on to the question of urban passenger transportation, and will touch upon the relative advantages and attractions offered by the several different forms of transport available, together with some of the views which I hold as to the likely future development of the urban transport problem.

Five distinct forms of passenger conveyance are in common use in England as in most other countries to-day, namely, the surface Railway, the Underground or Tube system, the Tramway or Street Car, the Rail-less trolley car and the motor omnibus. In an attempt to define the sphere of the motor omnibus in relation to these other forms of vehicular transport, it is necessary to consider what experience indicates to comprise the potentialities and limitations of each mode of transit, as governed by the conditions imposed in a practically fully developed and highly populated centre.

Taking the surface lines first, whilst these undoubtedly fulfil an important role in dealing with a certain proportion of suburban traffic, the scope for expansion is inevitably small, not only by reason of the impossibility in a crowded city of extending or duplicating tracks, but because the tracks from the in-town termini were in most cases laid primarily for dealing with main line traffic, and are, therefore, limited in capacity. Furthermore, "bottlenecks" often exist, which set a definite limit upon the possible service headways. Electrification of existing steam lines where this has not already been done, and a closer study of signalling efficiency will no doubt increase to a certain extent the capacity of these systems, but it is nevertheless clear that a fairly definite limit is fixed and that the real development of facilities must be looked for in the other more elastic means of transit.

Turning next to the Underground railway systems, these, without doubt, offer enormous possibilities for dealing with the radiating traffic from City to suburbs. Whereas the capital expenditure required for their construction constitutes the chief stumbling block in so far as their immediate development is concerned, I have little doubt that this system of transportation will ultimately prove the biggest factor in the solution of the congestion problem in most of the large cities. Their capacity for handling heavy loads and of operation at high average speeds render them especially suitable for dealing with heavy peak traffics, but since a comparatively high minimum traffic density factor exists below which the economical operation of such a costly system cannot in practice be maintained a fairly definite limit is fixed to the extent by which this radiating tube system can be multiplied. We are thus brought to a consideration of the relative suitability of the several surface facilities available for dealing with the varieties of traffic mentioned.

If the public demands are to be adequately met, the vehicles provided for them must be capable of high average speed, and must offer a high degree of comfort. The general public to-day is in these respects becoming more exacting; it is not satisfied with the conditions which prevailed a year or two ago, and looks for considerably more comfort and ease in riding. Experience has proved that a bright comfortable and speedy public service vehicle does attract custom, and these factors, therefore, have an important bearing upon the success or otherwise of the type of facility offered, particularly as more and more competition has to be faced from the privately owned motor car.

In respect of comfort, the necessary standard can be equally attainable in both the street car and the omnibus, but in respect of average speed, the superiority of either vehicle is dictated largely by circumstances. In highly congested areas the advantage generally lies with the omnibus owing to its high degree of manœuvrability and, therefore, its capability of passing other units of its own species or slow moving traffic likely to block the progress of the rail bound car.

The principal advantage claimed for the street car from the traffic handling point of view is its very large passenger carrying capacity. A large car capable of giving accommodation, including standees, for something over 100 people is definitely advantageous when dispersing large masses of workers from congested areas. From the economical point of view, however, the question of fare collection enters into the matter, for, unless the bulk of the passengers are long distance travellers, it is quite impossible to guard against a fairly large proportion of free riders.

Other advantages possessed by the street car may be said to include lower operating costs in many instances largely resultant upon lower cost of power production, safety of operation—it is less liable to get out of control in frost or snow—it can make good progress in foggy weather (a feature of more import perhaps in England than in this country!) and can be driven from either end, thus avoiding the necessity for providing turning space at terminal points.

Now, as to the disadvantages of the street car as I see them. First of all, there is the high initial cost of the track, and if one may venture to generalise from experience in London, the almost perpetual obstruction to traffic at some point or other on the route, consequent upon track repairs.

The inability of the rail bound cars to pass each other also constitutes a very serious handicap in those cases where several services must for a certain distance pass along a single main artery before dispersing to their several destinations. Where the track is laid

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# OMNIBUS AND COACH SECTION

along the middle of the roadway, passengers are exposed to the risk of being run down by following traffic, whilst at stopping places all other vehicles are held up, thus adding considerably to the general traffic congestion.

The vehicle which is confined to a track is also denied the very important advantage of deviation from line of route either for purposes of serving places of interest on special occasions or in the event of emergency. Experience of omnibus operation has shown that if full advantage is to be taken of the traffic offered, an entirely different programme of routing is necessary on a Saturday as compared with the week-days, with a further change on Sunday. With the rail or trolley car system such changes are not possible, so that advantage cannot be taken of gaining the additional revenue to be had by providing these special facilities.

In considering these disadvantages it will be clear that many of them are eliminated in the case where the tramway system is confined to a road of its own as distinct from the ordinary thoroughfare.

It will probably be remarked that my picture of the street car is rather a dreary one, and in the light of the vaster experience which has been obtained with the street car systems in this country, I may be open to some candid contradiction. The fact remains, however, that so far as London is concerned, had it not been for the passing of an Act of Parliament restricting omnibus services over tramway routes, thus forcing the public to patronise tramcars, all the tramway undertakings would by now have become bankrupt.

The principal deterrent against scrapping the tramways in those instances where they have been found no longer capable of providing adequate service, lies, of course, in the enormous amount of capital which has been sunk in the permanent way, power stations, etc., required for their operation. This has resulted in the adoption of a middle course and the introduction of the rail-less trolley car which, in many cases, where traffic is not too dense, has proved itself to offer an economical and generally quite satisfactory expedient. I use the word " expedient " advisedly, because although shorn of a number of disadvantages inherent with its rail-bound brethren. the trolley car is still less mobile than the motor omnibus, and cannot be diverted from its fixed line of route. It is, therefore, in my opinion, largely of a transitory nature, and I cannot believe that any undertaking contemplating the initiation of a new passenger transport system would, for one moment, consider the adoption of the rail-less trolley vehicle in place of the omnibus.

Passing now to consideration of the omnibus itself, it has been quite frequently debited with the following disadvantages as compared with the street car or rail-less trolley :—

(1) Higher operating costs.
(2) Short life and high depreciation.
(3) Slow acceleration.
(4) Inability to handle peak traffic expeditiously.
(5) Discomfort caused by gear jerking.
(6) Noise.
(7) Is exposed to fire risk.
(8) Emits noxious fumes.
(9) Is very complicated.

In regard to item 1, the contention that the all-in cost of operation of the omnibus is appreciably greater than that of the rail or rail-less car, is not borne out in practice provided efficient staff allocation and economical maintenance are ensured. As to Item 2, if efficient and scientific systems of repair and periodical overhaul are followed, the depreciation factor of the vehicles by no means constitutes a serious item, whilst the rapid development of design and construction renders it desirable to substitute up to date vehicles for those which in the course of four or five years have inevitably become obsolete.

The disadvantages falling under heads 3, 5 and 6, whilst no doubt applicable to omnibuses of the earlier days, can, with the advent of the more modern designs of vehicle, be discounted as of negligible significance in the eyes of the travelling public. So far as Items 3 and 5 are concerned, we can, if we wish, resort to the gasoline electrical type of vehicle with which very high rates of acceleration with the complete elimination of gear or clutch jerking, can be achieved, albeit at the expense of somewhat higher running costs.

So far as the capabilities of handling peak load traffic are concerned, our experience in London with the six-wheeled double deck type of omnibus, capable of carrying 70 passengers, excluding standees, has satisfied me that this type of vehicle is fully able to compete with the tramcar in this respect. I would have no hesitation in claiming that by replacing a system of ordinary street cars with a fleet of this type of omnibus, an equivalent if not superior service could be maintained.

As regards fire risk, whereas I fully endorse the plea that every effort should be made to find some means of substituting the highly inflammable gasoline by a less volatile class of fuel, experience with the 4,000 odd omnibuses operating in the streets of London to-day proves that in practice the risk of personal injury or even damage to rolling stock caused by ignition of the fuel is negligible providing the necessary common sense precautions are strictly enforced.

The exhaust fume bogey can, I think, be easily laid, since the results of recent scientific investigation into the contamination of the atmosphere in thoroughfares congested by the offending vehicles, has shown that the proportion of injurious gases likely to be inhaled by passengers or persons using the side walks is insignificant, provided reasonable care is taken to ensure against grossly inefficient carburation.

The plea of complication can, I think, be disregarded as a factor in no way influencing the issue. By adopting a system of maintenance whereby complete units are changed for any reason other than an easily rectifiable defect, semi-skilled labour can be employed at the garages and the repair of the defective unit attended to by skilled staff attached to the central overhaul establishment.

From the point of view of street congestion, it is desirable to reduce as far as practicable, the length of the vehicle, not only because of the actual road space which it occupies, but also with a view to increasing its manœuvrability. These requirements are in my experience best met with a forward control chassis—by which I mean the design having the driver alongside the engine—with a double deck covered top body having a rear platform of ample proportions. The capacity best suited to meet the demands of individual services, must, of course, be decided by a careful study of the running costs of the vehicles together with the loadings and other factors prevailing on existing or similar services, so that a balance may be struck between the calculated running costs and the traffic receipts expected.

Experience in London has indicated that the most satisfactory size of vehicle for operation on the average in-town or through-town service is the 50-seater. With this size of vehicle reasonably short headway intervals can be allowed, whilst the time taken to load and unload permits a good average speed to be maintained. A four-wheeler chassis best suits the needs of this size of vehicle, since apart from other considerations, a vehicle required to operate through congested and possibly narrow streets, should be of as short wheel base as possible. For the long haul type of facility such as those services radiating from the centre of the City to its boundaries, the large six wheeler capable of handling 70 seated passengers offers the best solution.

As regards the single deck type of vehicle, the economic possibilities of this class of vehicle are necessarily somewhat limited, owing to their comparatively small carrying capacity if restricted to reasonable limits of length.

So far as future developments of chassis design are concerned, I believe that the biggest break from the orthodox as we know it to-day will lie in the adoption for passenger transport vehicles of the heavy oil compression ignition engine. The possibilities of satisfactorily utilising the heavier or less highly refined oils in the road motor engine have always been attractive, and for this reason I have closely watched the progress made in this connection, both in England and by our Continental neighbours. Experiments have also been carried out by my Company from time to time with different systems in order to gain some first hand knowledge of their performance under conditions comparable with actual omnibus service. As a result of these investigations, I have been drawn to the conclusion that the rather formidable list of objections and obstacles generally cited as rendering the heavy oil engine inherently unsuited for application to the city omnibus, is actually by no means insurmountable. Already several of the earlier disadvantages, such as indifferent and odoriferous idling performance and low maximum speed, have been much reduced in significance, and there are several engines of the compression ignition type in operation in Great Britain to-day, which are putting up a very gratifying performance. At least one such engine is operating in omnibus service in the north of England, and I have very little doubt that in the course of the next two years this form of power unit will become a recognised adjunct to the city going omnibus. The outstanding advantages of the heavy oil engine are, of course, two-fold. Firstly, the cost of the heavy fuel is less than of gasoline since much of the refining process is eliminated, whilst running costs are still further reduced by merit of the high specific fuel economy of the compression ignition engine. Secondly, the fire risk associated with gasoline is rendered negligible with the heavy and less inflammable oil. I feel sure it will be agreed that both these goals are well worth striving for in the interests of cheaper and safer passenger transport, and that every encouragement should be given to the development of this new line of research.

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# OMNIBUS AND COACH SECTION

## STRACHAN'S LATEST SALOON COACH.

DESIGNED FOR WINTER AND SUMMER SERVICE.

The illustration on this page shows one of the 32-seat saloon coaches which Messrs. Strachan, Ltd., of Wales Farm Road, Acton, London, W., have evolved for all the year round, long-distance services, in which the comfort of the passenger in the winter are considered equally with that necessary for summer services.

The coach which is mounted on a Thornycroft F.C. six-wheel chassis with forward control, gives the maximum space for the seating which consists of bucket seats, all facing forward, with a special type of spring cushion and upholstered in powder blue leather. Ample ventilation is provided, there are eight drop windows on each side, operated by Strachan's patent lifting gear, each of these being fitted with glass louvres which, even in wet weather, permit the windows to be lowered two inches without inconvenience to the passengers. A special feature is an oval sky-light in the roof, while the ventilation is further improved by the fitting of two air vacs and four hinged vents. Metal louvres are also arranged along each side immediately below the roof. There are two entrances on the near side, both of which are of the full coach door type with drop windows, and an emergency door on the off side. Spring blinds are fitted to all windows, while a novel type of parcel loft runs along each side of the coach. The interior is brilliantly illuminated by a special type of lamp of pleasing appearance, flush with the roof. The metal fittings are all finished either in black oxidise or Doverite, and these include the rug rails, grips, ash trays, cabinet for chocolates and cigarettes, etc. A mirror and clock is also fitted to the front bulkhead.

The floor is covered with "sorbo", and the comfort of the passengers is ensured in cold weather by the installation of a complete heating system operated from the exhaust manifold.

A half-cab of the complete floating type is provided for the driver, with full coach door and sliding window for signalling purposes. The exterior fittings are all chromium plated, while a destination indicator of the screen type is built in at the front of the canopy. The exterior of the body, which, as will be seen in the illustration, is of very attractive appearance, is covered entirely with aluminium, including the panels and pillars. Double mouldings are mounted at the waist, the space between being finished in black and white shan cane work, while the rest of the body is finished in ivory with black mouldings. Ample luggage lockers are fitted under the body, these are of easy access and have double locks. A "Staybright" bumper rail is fitted round the body immediately over the locker doors.

A Strachan body for all the year round Long Distance Service.

## SOME RECENT ORDERS.

LEYLAND MOTORS, LTD., are supplying three "Titan" chassis to Warrington Corporation.

BIRMINGHAM TRAMWAYS COMMITTEE has authorised the purchase of sixteen Austin 8 H.P. cars for the use of departmental officials.

WANDSWORTH COUNCIL has accepted the tender of Karrier Motors, Ltd., for a motor sweeping machine with sprinkler and collector.

BIRKENHEAD SANITARY COMMITTEE has accepted the tender of Dennis Bros., Ltd., for the supply of two six-ton lorries with pneumatic tyres.

PLYMOUTH TRANSPORT COMMITTEE has accepted the tender of Leyland Motors, Ltd., for the supply of six double-deck omnibuses at £1,688 10s. each.

LEEDS TRAMWAYS COMMITTEE has agreed to purchase from Crossley Motors, Ltd., a double-deck omnibus at present in service for demonstration purposes.

ELECTRICARS, LTD.'s tender for the supply of a refuse collecting vehicle has been recommended for acceptance by East Ham Cleansing Committee.

THE WAR OFFICE has placed a contract with John I. Thornycroft and Co., Ltd., for over forty of their latest type of six-cylinder rigid six-wheel motor vehicles, for service with the Army mechanical transport.

DENNIS BROS., LTD., have an order from the Aldershot and District Traction Co. for a large number of their HV chassis, which carries a low-loading double-deck body, seating 50-52 passengers. The company already operates some 280 Dennis omnibuses.

LEYLAND MOTORS, LTD., have supplied fourteen "Titan" double-deck omnibuses with fully enclosed staircases, to the Maidstone and District Motor Services. These vehicles comprise the fourth repeat order given by the company, which now has a fleet of over sixty Leylands.

BIRKENHEAD CORPORATION has accepted the tender of Dennis Bros., Ltd., for the supply of two six-ton pneumatic-tyred lorries. Dennis Bros. have also supplied a lorry to Leeds Health Committee, a fire engine to Loughton Urban Council, and a gully emptying machine to East Ham Corporaton.

COMMER CARS, LTD., in addition to shipping "Invader" chassis to Hong Kong and Australia, have supplied two "Avenger" chassis to a Belfast operator, and other models to the proprietors of Shell-Mex, to Peterborough Co-operative Society, Brown & Polson, Glico Petroleum, the Cement Marketing Co., and Holbrook, Ltd.

THE VULCAN MOTOR AND ENGINEERING CO. have another order from Hong Kong and Shanghai Hotels, Ltd., for five Vulcan

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# OMNIBUS AND COACH SECTION

"Duchess" 26-seat omnibuses. This is the fourth repeat order from these hotels, which now run a fleet of 29 Vulcan omnibuses. The Vulcan Co. have also an order for eleven 3-5 ton subsidy type chassis with cabs from the War Office.

KARRIER MOTORS, LTD., have supplied to Huddersfield Corporation three "Consort" six-wheel double-deck omnibuses, which are to be operated by the Corporation in conjunction with the London, Midland and Scottish Railway Co. The bodies seat 56 passengers, and were built by Park Royal Coachworks, Ltd., of London. Karrier Motors have also lately delivered four "Chaser" six-cylinder single-deck omnibuses to Sunderland Corporation.

LONDON COUNTY COUNCIL Highways Committee decided, at the last meeting prior to the summer recess, that fourteen mechanically propelled vehicles should be purchased at a cost not exceeding £9,790. It is proposed to replace three 28-H.P. landaulette cars and a number of steam lorries. At present there are in use 18 steam lorries purchased between 1907 and 1920. The Establishments Committee proposes to provide six cars for the use of officials at a cost of £2,125.

DOUGLAS (I.O.M.) CORPORATION recently purchased seven Tilling-Stevens petrol-electric omnibuses. These machines are of 30-40 H.P. and carry 34 passengers. The vehicles are fitted with semi-bucket back seats, upholstered in red hide, and have Strachans' drop windows. On the back platform are tip-up seats and there is room for some luggage. Four-wheel brakes of the servo-type are fitted. Douglas Corporation now have 40 omnibuses, some of which have been in service for many years, and will require to be replaced shortly.

CROSSLEY MOTORS, LTD., have received an order from the Crown Agents for the Colonies for 20 60 H.P. Crossley six-wheelers for the mechanisation of the King's African Rifles stationed at Nairobi and Dar-es-Salaam. Crossley Motors, Ltd., have previously supplied a number of six-wheelers for the mechanisation of the King's African Rifles stationed in Kenya. The company have also a second repeat order from Rochdale Corporation for six 32-seat 38-100-H.P. six-cylinder omnibuses and eight 50-seat "Condor" double-deckers.

THE ENGLISH ELECTRIC COMPANY have received an order from Walsall Corporation for two A.E.C.-English Electric double-deck ow-loading trolleybuses. Each vehicle will have a seating capacity for 60 passengers. The chassis will be built by the Associated Equipment Co., Ltd., and will be their model 663 T, which has a wheel-base of 16 ft. 6 ins., with rheostatic, air and hand-brakes. The body and the electrical equipment will be constructed by the English Electric Company, the equipment consisting of a DK.130 80-H.P. motor, mounted in a forward position on the chassis, and a standard "English Electric" conductor-type foot-operated controller.

One of many A.E.C. "Regent" Omnibuses operated by the East Surrey Company.

## HAWKES' SAFETY GLASS.

Messrs. O. C. Hawkes, of Bromsgrove Street, Birmingham, the old-established firm of glass manufacturers, have recently issued a new catalogue, which includes a complete price list and area calculator in connection with the Hawkes Safety Glass Co., of which they are the proprietors. Realising the difficulty that frequently occurs in ascertaining the cost of fitting safety glass as a replacement, Messrs. Hawkes have compiled a list of leading models showing the cost separately of fitting the body and wind-screen in each of the three qualities which the firm makes. The price of each quality is also given per foot, together with the cost of grinding, polishing, corner cutting, drilling, etc., so that with the aid of the "Area Calculator" the actual cost of any size plate or sheet of safety glass can be readily obtained. Fitting instructions are also given. Copies of this catalogue can be obtained by application to Hawkes Safety Glass Co., Globe Works, Bromsgrove Street, Birmingham.

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# OMNIBUS AND COACH SECTION

## OMNIBUS AND COACH SERVICES.

### MUNICIPAL.

BELFAST FARES.—An application has been made to the Northern Ireland Ministry for a revision of the fares charged on Belfast Corporation omnibuses. It is proposed that the new fares be on a 1d.-per-mile basis, and that the return ticket be abolished.

OMNIBUSES FOR WALLASEY.—Wallasey Corporation proposes to replace all its tramcars by motor omnibuses within five years. The Tramways Committee has recommended that on the Warren Drive tramway route omnibuses should be substituted within a few months.

ROCHDALE CORPORATION BILL, which sought to extend the radius in which the Corporation might run omnibuses and to abandon tramway routes and to substitute omnibuses, came before the Unopposed Bills Committee of the House of Lords and was passed for third reading.

GARAGE EXTENSION AT LEEDS.—The Lord Mayor of Leeds on July 21 opened an extension to the municipal omnibus garage. The interior of the whole garage has been rearranged and brought up to date, the total expenditure amounting to £46,580, which has been met out of revenue.

NEWCASTLE PURCHASES A ROUTE.—The service hitherto operated by the Fawdon Omnibus Company has been purchased by Newcastle Corporation Transport Committee, together with three omnibuses. The company proposed to concentrate on its long-distance service to Coventry.

SHEFFIELD CORPORATION LOSES AN APPEAL.—Lord Chief Justice Hewart and Justices Avory and Wright on July 22 heard an appeal by Sheffield Corporation against a conviction for aiding one of their omnibus drivers to exceed the speed limit. Without calling on the respondents the Court dismissed the appeal. The same course was followed in a second appeal relating to another driver.

A COLCHESTER TRANSPORT PRIZE.—A tableau arranged by the Corporation Transport Department was awarded first prize in the transport section of Colchester civic week carnival. It comprised the "Times" omnibus of 1850 from the museum of the London General Omnibus Co., and one of the Corporation's fleet of double-deck 95 h.p. "Regent" omnibuses from the Associated Equipment Company's works.

CARDIFF-MERTHYR RIVALRY.—As the result of a recent Ministry of Transport inquiry, the omnibuses of both the Cardiff and Merthyr Corporations have been authorised to ply for hire on the Cardiff-Merthyr route. No limit is placed on the number of omnibuses. Authority to run three vehicles each on the same route has been given by the Ministry to the Rhondda Tramways Company and Imperial Motors, Abercynon.

OMNIBUSES FOR EXETER.—The Corporation of Exeter has adopted a recommendation by the Tramways Committee to substitute petrol omnibuses for the tramways. As a beginning six double-deck vehicles are to be placed on the Alphington-Pinhoe route as soon as they can be purchased. It will be recalled that a year ago Mr. A. R. Fearnley, general manager of Sheffield Corporation Transport department, advised the use of omnibuses.

DERBY TRAFFIC COMMITTEE.—The Traffic Sub-Committee of Derby Corporation recommends that there should be one central omnibus station rather than several in different parts of the town. It proposes that the Corporation omnibuses should start from as near the central station as possible, and suggests that the abolition of the tramway system would materially help to speed up road traffic. The Committee assumes that the tramway system will be abolished when circumstances permit.

EXTENSIONS RECOMMENDED FOR SOUTHPORT.—A sub-committee of Southport Tramways Committee has decided against the substitution of the tramways by omnibuses. They consider that sufficient experience has not yet been gained to justify the change. They recommend, however, that tramcars should be taken off certain routes already covered to a certain extent by omnibus services, also introduction of several new routes, and the purchase of twelve new double-deck omnibuses.

CONTINUED EXPANSION AT EDINBURGH.—On the omnibus and coach section of Edinburgh Corporation Transport the capital expenditure up to May 15 last had been £351,685, of which amonnt £250,693 had been paid off. The number of motor vehicles in service was 148, of which total 25 were coaches that were chiefly used for tours in and around the city. To replace vehicles in use since 1920 and to deal with the increasing traffic, the Corporation in December last purchased 24 Daimler saloon omnibuses and three coaches, and it was later resolved to purchase 12 additional Daimler vehicles to deal with ordinary traffic and special hire work. The receipts for the year increased to £182,695, from £161,940, and after meeting the working expenses, interest and sinking fund there was a surplus of £505.

OMNIBUSES TO BE SUBSTITUTED AT WIGAN.—The Wigan Corporation have decided to abandon the whole of the tramway system and to substitute petrol omnibuses. The substitution will take place by stages, but as quickly as possible. Application will be made to borrow £62,700 for the purchase of 38 omnibuses. The tramways serve numerous outlying districts and total 27 miles. The loan debt amounts to £167,000, the bulk of which expires in about six years. For a long time discussions have taken place between the Corporation and the outlying local authorities, and members of the Council have been divided as to whether petrol omnibuses or trolleybuses should be substituted. As it would take some eighteen months to get the necessary powers to operate trolleybuses, it was decided to introduce petrol omnibuses.

### COMPANY.

AN IRISH PURCHASE.—The Great Northern Railway of Ireland has purchased the omnibus services of Roberts & Company, Londonderry.

A SCOTTISH PURCHASE.—Alexander & Company, of Falkirk, are stated to have purchased the Banff-Aberdeen omnibus service of A. W. and H. Davidson, of Banff.

BRIGHTON LICENCES TRANSFERRED.—Eight of the coach licences of the well-known Brighton firm of Mr. A. Potts have been transferred to the Southdown Motor Services.

EMERGENCY DOORS.—Manchester Watch Committee has announced that in future they will not licence omnibuses which are not provided with emergency doors on the off side.

OMNIBUS AND BOAT TICKETS.—The Queen line of pleasure steamers sailing from Southend offers combined omnibus and boat tickets to Southwold, Lowestoft, Gorleston, and Yarmouth.

THE CHANGE-OVER AT PETERBOROUGH.—The tramway services of Peterborough Electric Traction Co., Ltd., to Dogsthorpe and Newark have been withdrawn and omnibus services substituted.

A SOUTH SHIELDS EXTENSION.—Sunderland District Omnibus Company has received the sanction of South Shields Corporation to an extension of its West Hartlepool-Sunderland service to South Shields, via the coast road.

UNLIMITED TRAVEL TICKETS.—East Yorkshire Motor Services, Ltd., issues for 8s. a ticket that can be used from Monday to Friday on regular services, excluding limited stop long-distance journeys. Bank holidays are also excluded.

COMBINED ROAD AND RIVER TRIP.—By an arrangement with Brown's River Trips, Premier Coaches now offer passengers to Windsor from Bush House, London, a 6½-hours' trip on a river launch to Marlow and back. The return fare is 16s.

LENGTH OF OMNIBUSES IN SOUTH DEVON.—On the recommendation of the South Devon Advisory Committee, the Traffic Committee of Torquay Corporation has decided to adhere to its previous decision that omnibuses shall not exceed 25 ft. in length.

OMNIBUSES REPLACE TRAMCARS IN LANARKSHIRE.—Towards the end of July some of the tramcars operated by the old Lanarkshire Tramways Company have been withdrawn from certain routes and omnibuses substituted by the newly-formed Lanarkshire Traction Company.

COACH WITH A SLIDING DOORWAY.—Recent deliveries of Gilford coaches to Majestic Motorways, Ltd., of London, include bodies each having a sliding door at the front of the near side. The driver's cab and the windscreen are of unsplinterable glass. The body complies with Scotland Yard regulations.

ROAD-RAIL BRIGHTON TRIPS.—By an arrangement between the Southern Railway and the Southdown Motor Services holders of return halves of day or period tickets issued by the latter company from London are allowed to return by rail from Brighton on payment of 2s. for an adult and 1s. for a child.

SMOKING IN BRISTOL OMNIBUSES.—The ban on smokers in the omnibuses of the Bristol Tramways Company has been withdrawn. An official recently said that the general experience had been that women, whether smoking or not, would sit in a smoking compartment, and that hardly anyone objected to smoking.

RIVAL OMNIBUSES AT MIDDLESBROUGH.—Middlesbrough Corporation proposes to take action to stop the blocking of the approach to its transporter bridge by omnibuses of competing companies.

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# OMNIBUS AND COACH SECTION

It is stated that some owners of omnibuses parked them practically across the bridge to prevent rival omnibuses getting away first.

NUMBER OF OMNIBUSES IN LONDON.—Replying to a question in the House of Commons on July 30, the Home Secretary said that the number of omnibuses licensed to ply for hire in the Metropolitan police district on January 1 was 4,877. At the beginning of 1913 the number was 2,908, and at the beginning of 1920 it was 3,299.

CENTRAL STATION FOR NEWCASTLE.—Work is in progress on the central omnibus station planned for Newcastle-on-Tyne. The station is intended as a terminus for the West Tyne area, and it is expected that it will help to reduce traffic congestion. The Watch Committee estimate that the station will realise a net profit of £500 per annum.

SCOTTISH EMPLOYEES' DEMANDS.—At a conference of omnibus employees held in Glasgow on July 11 it was decided to press forward a scheme for securing a comprehensive agreement in relation to wages and conditions. A resolution was passed deprecating alleged poaching and division of workers by the National Union of Railwaymen.

NEW LICENCES AT HULL.—The Hull and District Joint Advisory Committee has recommended the granting of two licences to Binnington's Motors, Ltd., for omnibuses to serve Willerby and Hornsea from Hull; and licences to East Yorkshire Motor Services, Ltd., and the North-Western Road Car Company for services between Hull and Manchester.

EAST YORKSHIRE TOURING GUIDE.—A commendable publicity venture has to be credited to the East Yorkshire Motor Services, Ltd. It is issued by the British Publishing Company, 27, Chancery Lane, London, and takes the form of a 128-page guide to interesting places served by the omnibuses. These are of the general service type for routes up to 65 miles in length, in the area bounded by Hull, Scarborough, York, and Leeds, the services being sustained by 167 vehicles. There is also a fleet of luxurious coaches with six-cylinder engines, running express on long-distance routes.

THE RIBBLE COMPANY'S GROWTH.—In his remarks from the chair at the 11th annual meeting of Ribble Motor Services, Ltd., Mr. W. S. Wreathall stated that the company held practically the whole of the share capitals of the Rishton and Antley Motor Company, the Merseyside Touring Company, the Waterloo and Crosby Motor Services, and County Motors (Lancaster). The Ribble fleet consisted of 666 vehicles, while in addition the subsidiary companies had 185 vehicles. The L.M.S. Railway had acquired an interest equal to that of the largest shareholder.

L.G.O.C. EXPRESS SERVICES.—The new express services which the London General Omnibus Company is developing in London and the Home Counties for the protection of its ordinary rural traffic were taken over in the middle of July by a new venture known as The Green Line. This organisation also operates similar services to and from London now run by the East Surrey Traction Company and the Autocar Company, of Tunbridge Wells, two associated companies of the L.G.O.C. The Green Line coaches comprise luxurious bodies mounted on the A.E.C. "Regal" chassis, as is also the case with the scarlet painted bodies of the coaches operating the earlier express services. Among the towns served are Windsor, Sunbury, Guildford, Maidenhead, Reigate, Dorking, and Tunbridge Wells; also Brentwood and other places in the Eastern Counties.

### LONG-DISTANCE.

MERSEYSIDE COMPANY'S LONDON PROGRAMME.—The Merseyside Touring Company uses the London Coastal Station at Lupus Street, Vauxhall, as the terminus of their Liverpool-London Service.

U.A.S. LONDON STATION.—For the two services each way between London, Skegness, and Hunstanton the United Automobile Services (Boston Area) is using the London Coastal Station.

NEWCASTLE-BLACKPOOL SERVICE.—Penrith Licensing Committee has approved the proposal of Ribble Motor Services for a joint service with the United Automobile Services for Newcastle-Carlisle-Penrith-Blackpool.

NIGHT SERVICE FROM NEWCASTLE TO SCOTLAND.—Orange Bros., of Bedlington, have instituted a night service from Newcastle to Edinburgh and Glasgow. Another successful departure is the introduction of whole-day runs from Newcastle.

NIGHT SERVICE BY REQUEST.—On Fridays during July and August the Fawdon Bus Company is running, by request, a night service between Newcastle, Birmingham, and Coventry. The route is the same as is used for the day service.

YORKSHIRE COAST SERVICE.—The United Automobile Services have increased their twice-daily service between Newcastle, Scarborough, and Bridlington to three services a day. At Newcastle the service connects with vehicles serving Glasgow and Edinburgh.

MANCHESTER-LONDON NIGHT EXTENSION.—Since July 12 Fingland's Hire Cars, Ltd., of Manchester, have added a night service to their Manchester-London day service. The vehicles used are 26-seat coaches by Tilling-Stevens, Ltd., and toilet and inside luggage accommodation is provided.

NEW GLASGOW VENTURES.—Subject to insurances being adjusted without delay, the Glasgow Licensing Court has granted licences as follows: Orange Bros., Newcastle, 20 omnibuses between Glasgow and London; Scottish Motor Traction, nine omnibuses between Glasgow and Newcastle; MacShane, Liverpool, eight omnibuses to run between Glasgow and Liverpool.

CO-OPERATORS AND COACH TOURS.—The co-operative societies in Torquay, Paignton, Newton Abbot, and Teignmouth have established agencies for a daily coach service between Torquay, Bournemouth, and London. The service is worked in conjunction with the old-established coaching businesses of Woolwich Arsenal Co-operative Society and G. Ewer & Co., of Stamford Hill.

COMBINED COACH AND SEAPLANE SERVICE.—Except on Sundays, a combined road and air service is available from the North and Midlands to Calais. It has been arranged by the Central London Road Transport Station, of Crescent Place, W.C.2. The air crossing is made from Dover to Calais by seaplanes run by the Compagnie Aeriemne Francaise. A seaplane service is also available to Ostend and Le Touquet.

A JOINT SERVICE TO LONDON.—The West Yorkshire Road Car Co., Ltd., the Yorkshire (W.D.) Motor Services, Ltd., and the Yorkshire Traction Co., Ltd., have jointly instituted new daily services from Nottingham to London, via Leicester and Bedford. Other new joint services are to Birmingham, via Ashby-de-la-Zouch, and to Harrogate, West Riding and Scarborough, with bookings to intermediate towns.

MANCHESTER LONG-DISTANCE SERVICES.—Representatives of Manchester Corporation and neighbouring local authorities met on July 25 to discuss the co-ordination of omnibus services. A sub-committee was appointed to negotiate further with the railway companies running services in the area. It is understood that the routes discussed were those covering long distances and running through Manchester. It is hoped that an arrangement may be made with the railway companies on similar lines to the agreement between Manchester and the North Western Road Car Company so as to clear up the question of setting down and picking up within the city. In most cases long-distance omnibuses are not allowed to do this.

LICENSING CONDITIONS AT LEEDS.—The following special conditions will be attached by Leeds Watch Committee to future licences for omnibuses to ply for hire within the city in connection with long-distance services: (1) All seats shall be booked in advance; (2) all vehicles shall arrive at and depart from a garage and shall not pick up or set down passengers in the public streets of Leeds; (3) the inward and outward routes shall be as specified by the city council; (4) there shall be no stopping places on either the inward or outward route within the city, other than the terminal point; (5) there shall be no bookings on either the inward or outward route at a price less than 1s. more than the fare on the longest stopping service on the route desired; (6) time-tables showing full details of the whole service are to be submitted for approval.

LONG-DISTANCE COACHES IN LONDON.—In view of the increasing number of long-distance motor coaches entering and leaving London daily, interest attaches to the following statement made to the House of Commons on July 29 by Mr. Herbert Morrison, Minister of Transport, in reply to a question by Captain Sir Wm. Brass: "There is no information available as to the number of motor coaches which enter the centre of London daily. As regards size, motor coaches are subject to the statutory restrictions applicable to all heavy motor cars, but there is no direct control of these vehicles when in the Metropolitan Police District as regards either their number or the streets which they may traverse. They will, however, be controlled in these respects when the provisions of the Road Traffic Bill now before Parliament relating to public service vehicles in the Metropolitan Area come into force."

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# OMNIBUS AND COACH SECTION

## MOTOR TRAFFIC NOTES.

NEW MOTOR PARK AT LANCASTER.—A park which accommodates 350 vehicles has been opened by Lancaster Corporation in the centre of the town.

IRISH FREE STATE OMNIBUSES.—It is reported by the Irish Free State Government that during March 135 proprietors were operating omnibuses in that country.

TESTS OF SURFACING MATERIALS.—The experimental section of the Ministry of Transport is about to lay test sections of various surfacing materials on the Kingston by-pass.

A CROYDON PARKING SCHEME.—Croydon Corporation is to consider a proposal for providing accommodation for five hundred cars on land between Park Lane and Barclay Road.

INJURED ON TRAFFIC DUTY.—The Home Secretary informed the House of Commons on July 18 that 171 Metropolitan police constables were injured (none fatally) while regulating traffic in the past twelve months.

ENORMOUS YIELD OF THE PETROL TAX.—For the year ended March 31, 1930, the revenue derived from the motor spirit duty was approximately £14,675,000. Petroleum spirit other than petrol yielded approximately £274,000.

BY-LAWS FOR PETROL STATIONS.—For the purpose of regulating the appearance of petrol-filling stations and prohibiting the establishment of such stations in certain areas of the county, Surrey County Council has decided to make by-laws.

AN ADVOCATE OF TESTS FOR DRIVERS.—In an address which he recently gave at the annual conference of the Chief Constables' Association, Colonel Pickard, general secretary of the National Safety First Association, urged that tests should be instituted for drivers.

EFFECT OF TRAFFIC ON LONDON BUILDINGS.—In the annual report of the medical officer of health for Westminster it is stated that numerous buildings erected about one hundred years ago in that city are in danger of collapse owing to vibration set up by heavy traffic.

CLOSING OF BRANCH RAILWAY LINES.—In September the York-Scarborough branch railway and the branch lines between Hexham and Allendale and between Alnwick and Cornhill will cease to be used for passenger traffic. Motor omnibuses will be operated, with adequate inter-connections.

THE OUTLOOK FOR THE DIESEL ENGINE.—Speaking at the annual meeting of the Society of Chemical Industry, Dr. A. E. Dunstan, chief research chemist of the Anglo-Persian Oil Company, predicted that in five years there would be on the roads a preponderance of Diesel-engined vehicles.

MOTOR PATROLS.—In the House of Commons on July 28, the Home Secretary, in reply to a question, said that motor patrols in plain clothing are not at present on duty in the London area, to report cases of careless, inefficient or dangerous driving, but the question of employing them is under consideration.

TRAFFIC CONTROL LIGHTS AT LUDGATE-CIRCUS.—The City of London police on the morning of July 12 inaugurated the control of traffic at Ludgate Circus by light signals. The lights are worked by a constable standing in a "pulpit" on the Farringdon Street refuge. There is a marked speeding up as compared with the previous control by four constables.

LONDON'S REFUSE COLLECTION.—The report has been issued of the committee which was formed to consider a report on public cleansing in London by Mr. J. C. Dawes, inspector of public cleansing to the Ministry of Health. It is recommended that a central body should have charge of refuse collection and street cleansing, and that the vehicles now used should be replaced with modern machines.

SIX MONTHS' REGISTRATIONS.—During the six months ended May 31 the sum of £21,340,238 was received from the taxation of road vehicles, as against £20,312,028 for the corresponding period of 1929. The number of vehicles licensed at May 31 was approximately 2,130,000 (an increase of 103,000), and the number registered for the first time was 34,641, compared with 39,172 for the similar period of 1929.

PROSECUTIONS FOR NOISY VEHICLES.—The Home Secretary recently stated in the House of Commons that in the Metropolis officers were specially detailed for the duty of detecting ineffective silencing or excessive noise in motor vehicles. He assumed that the steps taken in provincial forces were similar. During the year ended February last there were 15,961 prosecutions for this offence in the Metropolitan district.

"CITY CIRCLE" AT BIRMINGHAM.—Birmingham Tramways and Omnibus Committee desire to inaugurate a service on a route to be defined as the "city circle," which comprises a number of streets. After examination of the streets the Committee reported that a number are unsuited for an omnibus service, and the Public Works Committee has decided to advise the Council to carry out the work of road reconstruction at an estimated cost of £35,326.

NEW VEHICLE REGISTRATIONS.—Returns issued by the Ministry of Transport, showing the number of new vehicles registered in Great Britain for the first time during the month of April, 1930, give the total of hackney vehicles as 1,364. For April, 1929, the number was 831. The increase is due to the number of new omnibuses licensed. Goods vehicles totalled 3,928, as against 4,308 in the corresponding month of 1929. The total number of new vehicles was 34,324, as compared with 34,602 for the same month in 1929.

HIGH BUILDINGS AND TRAFFIC CONGESTION.—In connection with a proposal by the London County Council to sanction an increase of 20 ft. in the height of 80 ft. now permitted for certain buildings, the Council's Special Committee on Traffic recommend that powers be obtained to insist on the provision of facilities to deal with vehicular traffic likely to be attracted to such tall buildings. Unless foresight is exercised in the near future, the committee consider that a problem may be created which will prove almost insuperable of solution.

LONDON STREET ACCIDENTS.—Sir Henry Jackson, a member of the London Traffic Advisory Committee, recently stated that more people are killed in London traffic on Fridays than on any other day of the week. The number of people under 15 years of age who are being killed in London streets was steadily decreasing. This was due to the intensive education given at schools on how to avoid street accidents. The number killed between the ages of 15 and 60 years was, however, steadily increasing. Last year over 70 per cent. of people killed were pedestrians, 13 per cent. were pedal cyclists, and 7 per cent. were motor cyclists.

GUIDE TO THE ROAD TRAFFIC ACT.—In view of the passing of the Road Traffic Act, 1930, the Automobile Association is issuing a booklet giving a digest of the main features of the law. The booklet is available to all motorists by postcard application to the Secretary, Fanum House, New Coventry Street, W.1, or to any of the A.A. branch offices throughout the country. As many important matters referred to in the Act have yet to be the subject of Regulations by the Minister of Transport, this booklet will be followed by a later date by the issue of an A.A. legal handbook, giving a comprehensive survey of the whole of the law and regulations affecting the motorist.

BRITISH ROAD TRANSPORT AHEAD OF CONTINENT.—Councillor Brassington, chairman of Manchester Transport Committee, who attended the International Tramways Congress at Warsaw, has returned with an unfavourable impression of Continental tramways. He says that British tramways compare very favourably with the best on the Continent. The omnibus systems of Germany and other places he visited have a long way to go before they reach the efficiency of those in this country. Berlin is still running cumbersome vehicles with huge wheels, high steps, and other features which disappeared from British omnibuses long ago. A novel feature in Berlin is the huge tenements for transport workers near the sheds.

IMPORTANT POINT IN A PROSECUTION.—At East Ham police court on July 22 a summons taken out against the driver of a heavy vehicle by the police came before Mr. Wyatt Paine. The offence alleged was that the driver "did by negligence interrupt the free passage of other vehicles using the highway," contrary to Section 78 of the Highways Act, 1835. A heavy lorry was proceeding at about 8 M.P.H. with its offside wheels on the crown of the road. A witness in a police car passed nine vehicles to go ahead of the defendant. Mr. Paine remarked that he did not think there was evidence of obstruction, and he would dismiss the case. If the summons had been taken out for not keeping to the left side of the road he could not, he added, have done other than convict. Five similar summonses against other drivers were withdrawn.

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THE
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LONDON, AUGUST 16, 1930.

## GLASGOW'S OPPORTUNITY.

Glasgow Corporation Tramways and Omnibus Department has now an enviable opportunity of making public passenger transport history. With a general manager of the vision and energy of Mr. L. Mackinnon to guide them, there is little doubt that the undertaking will be as successful in surmounting its past difficulties as Belfast has been under the guidance of Mr. W. Chamberlain. The second city of the Empire during the greater part of the post-war period allowed its tramways within and without the city to be overrun by unlicensed motor omnibuses. The truth is that the Corporation awakened too late to the advice that unregulated competition through the medium of more or less attractive omnibuses required to be met by similar machines, even though it had been decided to render the tramcars more comfortable and speedy. Notwithstanding a scale of tramway fares that was decidedly tempting to the public, from 1920 to the end of last year there was a drop in receipts of 5¾d. per car mile. Matters improved considerably when the department was able to meet its rivals with omnibuses that captured public patronage. Combined with the Corporation's success in July last in securing protection for their vehicles within the city area, the display of enterprise has placed the city in undisputed possession of the means of road transport. While the police authority is devoting attention to preventing vehicles from outside the city carrying short-distance passengers within the boundaries, the transport department is faced by an important duty to the public. In consequence, it is said, of inadequate notice given to private owners, many passengers who had used long-distance vehicles for a city journey only have been put to inconvenience. We are sure that the municipal officials are alive to the duty now incumbent upon them of providing adequate facilities for those persons who have found themselves dispossessed of their customary means of transport. One school of thought on the Corporation may counsel the entire shutting out of private enterprise, but that course will be in direct opposition to the policy favoured by the present Minister of Transport, a policy which has also to be paid heed to by the area traffic commissioners when, on November 1 next, they bring into force Part IV of the Road Traffic Act. Co-ordination of facilities is the chief purpose of Part IV. Glasgow Transport Committee has just over two months in which to shape their action towards that end. Steps already taken in other places for securing co-ordination include running over tramway routes at higher fares, and the bulk purchase of seats in private omnibuses by the local authority. To prove financially effective, the first-mentioned course must provide for an adequate fare. English experience is that the increased fare is too low at present.

## COACH CONGESTION IN LONDON.

It is complained that during the past two years considerable congestion has been created in London thoroughfares by an increasing number of coaches from all over the country making use of the streets as passenger stations. In the recently-issued report of the London and Home Counties Traffic Advisory Committee for the twelve months ended September 30 last, the Committee says: "The influx of large numbers of motor-coaches into the Metropolis is a matter which is causing some disquietude. We anticipate that the increasing employment of this type of vehicle will render it necessary at an early date to take steps to ensure that motor-coaches during their period of waiting in the Metropolis, shall be accommodated off the public highway."

## THE BRITISH MOTOR INDUSTRY.

The Society of Motor Manufacturers and Traders, in a booklet entitled "British Motor Industry: Summary, 1930," gives statistics of road transport in Great Britain, the British motor cars, and exports of other producing countries. The total mileage of all roads in Great Britain in 1929 was 179,095, compared with 178,918 in 1928. The total number of vehicles in the United Kingdom at the September census in 1929 was 1,540,732, as against 1,332,771 in 1928. The consumption of motor spirit was 918,600,000 gallons. The output of British motor vehicles in 1929 was 238,805, of which 182,347 were private cars, and 56,458 commercial vehicles. The total number of motor vehicles exported from the United Kingdom in 1929 was 42,021, compared with 32,777 in the previous year.

## AMERICAN OMNIBUS REGULATION.

When the U.S.A. Congress adjourned in July, the Parker-Couzens Bill for the regulation of inter-state omnibus traffic was among the unfinished business, although strenuous efforts were made to bring it before the Senate for passage. It was, however, blocked by the opposition, which regards the measure as a movement by railroad companies to gain control of the omnibus lines. The Bill will come up again when Congress meets on December 1. A review of the provisions of the Bill appeared in THE TRAMWAY AND RAILWAY WORLD of July 17.

## LONDON TRAMWAY FARES.

The average ordinary fare per mile of the tramways in the London area is as follows:—

| | | | | | |
|---|---|---|---|---|---|
| Bexley | 1.03d. | London | .56d. | London United Tramways | .90d. |
| Croydon | .85d. | Walthamstaw | .83d. | Metropolitan Elec. Trys. | .91d. |
| East Ham | .93d. | West Ham | 1.00d. | South Metropolitan Elec. Trys. | .97d. |
| Erith | .78d. | | | | |

Only two undertakings in the country have a lower fare per mile than the London County Council, viz., Liverpool .50d. and Leeds .53d. Leeds City Tramways has always been one of the most prosperous undertakings in the country, and it is interesting to recall that they have recently ordered 100 new cars of the latest type.

WORKMEN'S FARES.

Workmen's tickets are at present issued on all cars of the London County Council timed to arrive at central London termini between 5.30 and 8 a.m., and on all cars leaving central London termini between 3 and 7.30 a.m. The basis of fares, with a few exceptions, is 2d., 4d. and 6d. return for 2d., 4d. and 5d. ordinary single journey fares, respectively. The mileage and receipts from the workmen's cars, as compared with all other cars for the year ending March 31, 1930, were given in a report recently presented to the London County Council as follows:—

| | Mileage | Receipts £ | Per car mile. d. |
|---|---|---|---|
| Workmen's cars | 6,848,991 | 391,238 | 13.71 |
| All other cars for weekdays | 57,409,679 | 3,537,567 | 14.79 |

The average receipts per car mile for the workmen's mileage is thus 1.08d. lower than the receipts from all other cars. The average fare charged per mile for workmen is .38d., which compares with .63d. for ordinary rush-hour passengers at fares of 2d. and over. Taking the average journey as 3½ miles, and the difference in fare per mile at .25d., the loss in revenue on workmen's fares is about £170,000 for a year of 309 days. In view of these facts the Council recently declined to make any alteration in the hours of issue of workmen's tickets.

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## EFFECT OF GLASGOW'S NEW POWERS.

Steps have been taken since August 8 to secure observance of the new Glasgow Corporation Act, which gives the Corporation the sole power of transport within the city boundaries. Many people in the suburbs who had been accustomed to travelling to the city by private omnibuses have been surprised to find those vehicles now failing to stop and pick them up. Some that did stop had the drivers' names taken by the police, and summonses may be issued for carrying short-distance passengers within the city boundaries or for issuing season or other preferential tickets to passengers. Officials of the tramways have been watching the traffic with a view to remedying any deficiencies in the accommodation.

More than 500 omnibuses are affected, and the owners allege that the Act has been brought into operation without adequate warning, thus preventing the owners informing their customers of the change. It is expected that numerous services will have to be abandoned and staffs reduced, as long-distance runs were subsidised by the short-distance traffic now banned.

## MISCELLANEOUS NEWS AND NOTES.

**Increase in Fares at Hastings.**—As the result of an agreement between transport interests in Hastings, the omnibus and trolleybus fares have been increased.

**Bolton Tramway Employees.**—It is reported that a majority of the non-unionists in the service of Bolton Corporation Tramways have joined the Transport and General Workers' Union.

**Glasgow's Sunday Tramcars.**—The Sunday morning tramcars in Glasgow now start from the termini about eight o'clock, an hour earlier than before. They are also running later on Sunday nights.

**Fire in London Tramcar.**—The cause of the fire in a London tramcar on July 30, which was wrongly reported to have been struck by lightning, was the burning out of a controller into which water had penetrated during a heavy rainstorm.

**The Shanghai Tramway Strike Ended.**—"The Times" correspondent at Shanghai reports that the Communist-inspired strike of the French tramway workers which has lasted for six weeks, ended on August 12, and the full service was being resumed.

**Great Garage Scheme for Glasgow.**—The Corporation Transport Committee has instructed the general manager and a sub-committee to present a report regarding the acquisition of a site for the erection of a garage to accommodate 100 double-deck omnibuses.

**Maidstone and District Motor Services, Ltd.,** have acquired a controlling interest in the Chatham and District Traction Co., formerly the Chatham and District Light Railway Co. The tramways are to be replaced by a motor omnibus service as soon as practicable.

**Road Traffic Act.**—A booklet summarising and explaining the new motoring laws has been issued by the Automobile Association, and is available to every motorist on a postcard application to the Association, Fanum House, New Coventry-street, London, W.1, or to any of the A.A. branch offices.

**Bolton Employees' Short Time.**—In view of the suspension of the guaranteed 48-hour week, tramway employees at Bolton wish to be trained in the driving of omnibuses. Mr. J. Barnard, the general manager, has suggested that the best plan would be to give the present system of curtailment a month's trial.

**Sale of Locomotive Works.**—A news agency states that George Cohen, Sons & Co., Ltd., of Commercial Road, E., have purchased the locomotive works of Kerr, Stuart & Co., Ltd., Stoke-on-Trent. The works cover 26½ acres of ground. Arrangements have been made for the manufacture of spare parts for engines made by the company.

**Buenos Aires Tube Railway.**—Buenos Aires City Council recently granted a concession for the construction of an underground railway to a Spanish Company, Compania Ananima de Proyectos y Construcciones de Madrid. The Municipal Intendent has now vetoed the concession. To over-ride this veto, a majority of two-thirds of the Council would be required.

**No Omnibus Demonstration at Harrogate.**—We have been asked by the general secretary of the Municipal Tramways and Transport Association to announce that there will be no omnibus demonstration at the conference to be held at Harrogate from September 24 to 26. The Council specially request that omnibus manufacturers should refrain from sending any omnibuses.

**Slack Period Problem for Express Omnibuses.**—In his annual report on Liverpool Corporation Tramways, Mr. P. Priestly, the general manager, mentions that express omnibus services at higher fares than the tramcar fares have been instituted from the centre of the city to districts already served by tramways. During the rush hours these services were fairly well patronised, but at other periods passengers use the tramcars and pay the lower fares. Free passes to blind persons, disabled ex-Service men and others, are estimated to have cost the department £15,493.

**Fines for Omnibus Speed.**—At Wath, Ripon, on August 5, the West Yorkshire Road Car Co. and the Northern General Transport Co. were fined £15 each, and the drivers £10 and £5 respectively, for exceeding the speed limit of 20 miles per hour. Mr. W. E. Woods, for the defence, said the service was between Liverpool and Newcastle, and according to the timetable the omnibuses would travel at 21 miles an hour, allowing for stops, on the journey of 169 miles. On a portion of the journey a speed of 27 miles was necessary to keep the time, but this was well within the limits of the Road Traffic Act. The companies had issued instructions to their drivers to ignore the timetable on that part of the journey until a new one was issued to bring the speed within legal limit.

**The "English Electric Journal"** for the current quarter contains an illustrated article on the new E.H.T. switching installation at the Greenwich power station of the London County Council. The photograph of the new chairman of the company, Sir Holbery Mensforth, K.C.B., C.B.E., M.Sc., forms the frontispiece of the issue. There is also an article on "Some New Trolleybuses and Their Control."

**Ayr Tramways to Continue.**—At a meeting of Ayr Town Council on Monday a motion by Treasurer Galloway that a plebiscite be taken on the question of continuing or scrapping the tramways was defeated by the casting vote of Provost Stewart. It was then decided to accept tenders totalling £11,863 for relaying the track from the Grammar School to the Town Hall, and a tender for reconditioning three cars.

**Glasgow Report on Berlin Transport.**—Herr Reuter, chairman of the Berlin Municipal Transport, has written to Mr. L. Mackinnon, general manager of Glasgow Transport, expressing his appreciation of the report on the Berlin system prepared by the deputation from Glasgow which recently visited the German capital. Herr Reuter says it is the most authoritative account of the Berlin system which has yet been written in a foreign language.

**Tramway Wages at Liverpool.**—A recent wages award of the Industrial Court has benefited a number of employees of the Liverpool Tramways Department. The increase of wages granted to inspectors and certain other grades were made retrospective as from December 10 last year. About 400 employees receive increases under the award, and the ultimate cost will be about £4,000 a year. There is no advance for traffic men, but their present wages are stabilised.

**Wigan Corporation's Decision** to replace the tramways with omnibuses does not imply that petrol vehicles will always be used. The Corporation has decided to seek in the next session of Parliament trolleybus powers for all the routes. For the first three months of the current financial year the Corporation petrol omnibuses show a profit of £521, while the trolleybuses have a balance of income over expenditure of £780. The tramways have an excess of expenditure over revenue of £1,503.

**L.U.T. Trolleybus Powers.**—The Parliamentary Committee of Middlesex County Council has reported on the Bill of the London United Tramways Co., which sought powers to substitute trolleybuses over the whole of their system. The company had met the objections of the Council and had agreed to restrict the operation of the Bill to specified tramways in Twickenham, Hampton and Hampton Wick. Towards the restoration of the roads they would contribute 9s. a yard. The Bill has received the Royal Assent.

**Railway Dismissals.**—The "Railway Review," the organ of the National Union of Railwaymen, states that on the L.N.E. Railway over 2,000 men have already received notice to leave the service. The men are spread over all departments. The reason given by the company for this step is a serious decline of traffic, and the "Review" states that "so far as can be seen, there is not the slightest ground for contesting such statements." The weekly traffic returns are unfortunately only too indicative of the state of affairs.

**New National Programme of the N.U.R.**—The Executive of the National Union of Railwaymen propose to submit to a special meeting of delegates, to be held in London on October 24, a national programme for improved conditions. Under the agreement entered into between the railway companies and railway trade unions in October last year, the 2½ per cent. wage reduction accepted for all grades in 1928 was restored on May 12, the unions undertaking that until November 12, 1930, no general proposals to vary pay or conditions should be made by either side in the industry.

**Conductor fined for Overloading.**—A Rawtenstall Corporation tramcar conductor was fined 10s. at Bacup on August 14 for allowing a tramcar to be overloaded. It was alleged that there were 134 passengers on the car, which was registered to carry 68. The conductor's defence was that he could not prevent workpeople from getting on the car. The Chairman, Alderman J. H. Lord, said the position of a conductor of a dinner-time car was difficult, particularly if the weather was wet. The magistrates thought the Corporation should go into the matter and see if something could not be done to avoid the overcrowding.

**Proposed New London Tramway Service.**—The London United Tramways, Ltd., and the London County Council propose to enter into an agreement under which the Council will operate the Haydons-road tramway which links the Garratt-lane section at Summerstown with Merton High-street on the company's Tooting-Wimbledon line, which is also worked by the County Council. The construction of a change pit at a cost of £2,450 will enable the Council's cars to run through. It is proposed to institute a service from the Hop Exchange at London Bridge to the Victoria Embankment, Vauxhall, Battersea, Garratt-lane, and Haydon's-road.

**Road Reinstatement at Accrington.**—A report submitted by the Borough Treasurer to the Corporation Transport Committee estimates that the total cost of reinstating the roadways on the Accrington Tramways will be £11,519. The estimate is based on the amount named by Lancashire County Council for the Manchester-road section. Deducting the estimated scrap value of the rails, the net cost of the reinstatement will be £9,022. The liabilities attaching to the tramways system at March 31 are therefore: Outstanding debt, £37,941; reinstatement of roads, £9,022; total £46,963. The amount standing to the credit of the depreciation and renewals fund on March 31 was £58,948, so that the department has a surplus of £12,000.

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**Trolleybuses in South Africa.**—Mr. J. A. Bromley, manager of the Durban Corporation Transport, speaking at a conference in Durban of the South African Association of Road Passenger Transport Officials, said he was convinced that the trolleybus would be the solution of Durban's transport problem. It was considerably cheaper than either the petrol vehicle or the tramcar, and it was superior in efficiency and comfort. The operating costs per mile for tramcars was 19.7d., for the petrol omnibus 19d., and for the trolleybus 14.67d. Mr. Bromley has already recommended the Durban Council to substitute trolleybuses for the tramways.

**Ulster Omnibus Fares.**—The Road Transport Fares Tribunal of Northern Ireland has granted the application of the London, Midland and Scottish Railway for an alteration in the omnibus fares between Belfast and Ballyclare. The application was heard on June 11, and a decision was postponed until a fare list had been submitted by the company. Sanction was sought for a fare list based on 1d. a mile for a single journey, a fraction of a mile being disregarded, and the same figure plus 50 per cent. for the return journey. The basis was, however, modified in certain cases. For weekly season tickets, the proposed rates were based on six single fares determined in accordance with the schedule above mentioned. The Tribunal decided that the new fares should be put into operation on September 1, 1930, and should be reviewed by the Tribunal on the basis of the experience as to costs and receipts for the year ending August 31, 1931.

**Omnibuses for Southport.**—Southport Town Council has decided to replace the tramways on three routes, and to replace them with omnibus services. Councillor Billington, chairman of the Tramways Committee, in advising the change, said that the undertaking was at present in one of the most favourable positions of any tramway undertaking, and there was never a better time than the present to try the experiment of running omnibuses. A sub-committee which has dealt with the matter, he explained, went fully into the question of trolleybuses, and they were forced to the conclusion that a better course would be to start a fleet of motor omnibuses. The Tramways Committee, he declared, had been wise in not deciding to scrap the whole of the tramways. There were only two or three towns in the country where omnibuses were paying, and it was not policy to throw something away which was making a profit in order to take up something which was more or less problematical.

## CONTRACTS.

**The Equipment & Engineering Co., Ltd.,** are supplying Leeds Corporation with a garage sweeper and sprinkler.

**Leigh Corporation** has placed an order for power petrolling plant with the Equipment & Engineering Co., Ltd.

**Hull Tramways Committee** has accepted the tender of Richard Johnson & Nephew for supplying two miles of trolley wire.

**Leeds Corporation** has ordered a T.A. type electro magnetic crack detector from the Equipment and Engineering Co., Ltd.

**East Surrey Traction Co., Ltd.,** have placed an order for power petrolling plant with the Equipment & Engineering Co., Ltd.

**Chesterfield Transport Department** has renewed for another year the contract under which tyres are supplied on a mileage basis by the Goodyear Tyre & Rubber Co., Ltd., Wolverhampton.

**Buenos Aires Pacific Railway** have placed an order for a type F. electro magnetic crack detector with the Equipment & Engineering Co., Ltd.

**Salford Corporation** has placed an order for a Luchard H.8. high-pressure air compressor for tyre inflation with the Equipment and Engineering Co., Ltd.

**Salford Electricity Committee** has recommended acceptance of the tender of John I. Thornycroft & Co., Ltd., for the supply of a six-ton lorry with tipping body.

**Chas. Wooler & Co.,** Alperton, have placed an order for a B.15 Luchard low-pressure air compressor with the Equipment and Engineering Co., Ltd.

**Liverpool Tramways Committee** has placed the following contracts: Welding of 200 tramway rail joints, Murex, Ltd.; tramway special trackwork, Edgar Allen & Co., Ltd.; electrically-driven tower wagon, General Vehicle Co.

**Manchester Transport Committee** has accepted the tender of the Cargo Fleet Iron Co., Ltd., for the supply of girder tramway rails, and the tender of A. & E. Sudlow & Co., Manchester, for electric light and power installation at Hyde-road car works.

**Rotherham Tramways Committee** has recommended acceptance of the tenders of Ransomes, Sims & Jefferies, Ltd., for 20 trolleybus chassis, and of Cravens, Ltd., for the bodies; also the tender of the British Mannesmann Tube Co., Ltd., for poles required for the conversion of the Dalton and Kimberworth tramway route to railless traction.

**The Associated Equipment Co., Ltd.,** have received the following orders: Three "Regent" double-deck chassis, Southampton Corporation, and one each from Borough Motor Services, Ltd., Empire Bus Co., and Pro Bono Publico, Ltd.; fifty "Regal" single-deck chassis, London General Omnibus Co., twelve from the Western Welsh Omnibus Co., six from Bath Tramways Co., three from Smith's Safety Services, and one each from Folkestone Harbour Garages, Bevan and Barker, Bush and Twiddy, Sykes Motor Services, L. Baddeley and Bury Corporation; "Reliance" single-decker, A. McKerchar. Montreal Tramways Co. has ordered two "Ranger" single-deck chassis.

## PERSONAL.

**Lord Cromer** has been elected a director of the Metropolitan Railway Company.

**Mr. F. J. Elliott** has been appointed chief engineering assistant at the Wolverhampton Corporation Electricity works.

**Mr. F. C. Lamacraft,** an inspector on the staff of Exeter Corporation Tramways, has been appointed traffic superintendent.

**Mr. Eric Mitford,** of the Gateshead and District Tramways Company, has been appointed assistant engineer of the Hong Kong Tramways, Ltd.

**Mr. N. A. Hardie,** general manager (sales) of the Associated Equipment Co., has returned from a tour through South America. Mr. Hardie left England in March last.

**Mr. W. B. Woodhouse,** engineer and manager of Electrical Distribution of Yorkshire, Ltd., since the formation of the company, has been appointed a director of the company.

**Mr. P. M. Rossdale** has been appointed chairman of the Yorkshire (Woollen District) Electric Tramways, Ltd., in succession to Mr. L. M. Myers, who resigned on account of ill-health.

**Mr. L. Mackinnon,** general manager of Glasgow Corporation Transport Department, is to be presented with his portrait in oils by the employees and officers, who number 8,624.

**Mr. Wallace Jones,** the ex-Birmingham motorman, has obtained another musical appointment besides that of first tuba player in the Hallé Orchestra, Manchester. The second appointment is with Liverpool Philharmonic Orchestra.

**Mr. J. H. Millen,** who was recently appointed electrical engineer to the London Underground Railway Companies, has been with those companies for twenty-seven years. At one time he was with the Dublin Tramways. Returning to London in 1903 he became chief assistant during the erection of the Lots-road power house. In 1916 he was appointed assistant superintendent of power, and superintendent in 1926.

**Mr. C. F. Wolsey,** who, as reported in our issue of August 9, has been appointed traffic superintendent of Stockport Corporation Tramway and Omnibuses, will take up his new duties in September. During the past eleven years Mr. Wolsey has been a chief assistant in the traffic department of Sheffield Tramways and Omnibuses, and he was previously with Lowestoft Corporation Tramways. In 1927 he was awarded the first prize and silver medal of the Municipal Tramways and Transport Association for an essay on transport operating problems. There were 42 applicants for the Stockport appointment.

We regret to record the death of **Mr. John Pugh Gregory,** manager for the past 29 years of the British Thomson-Houston Company's contract department.

We regret to record the death, which took place on August 8, of **Mr. John William Blakeborough,** who had been chief accountant in the Leeds Tramways Department for fifteen years. Mr. Blakeborough was fifty years of age. His association with the Tramways and Transport Department in Leeds began in July, 1900, as a cashier. Later he went into the accountant's office under the late Mr. T. J. Hutton, whom he succeeded as chief accountant in January, 1915. During his career in Leeds, he served under four general managers —Mr. W. Wharam, Mr. J. B. Hamilton, Mr. W. Chamberlain, and Mr. R. L. Horsfield, the present holder of the office. A genial personality, his popularity extended far beyond the city, as for a number of years he was auditor to the Municipal Tramways and Transport Association. He was regarded as an authority on finance in matters affecting tramways and transport, and was a contributor on these topics to the various tramways and municipal technical journals. He was also the author of a book entitled "A Practical Costing System Applied to Highway Administration." Mr. Blakeborough leaves a widow and one son.

## FINANCIAL.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended August 13 amounted to £77,106, a decrease of £1,782 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to August 13 (19 2-7 weeks), the total receipts were £1,596,311, a decrease of £11,916.

**Ipswich Trolleybus Finances.**—In his report on the trolleybus undertaking at Ipswich for the year ended March 31 last, Mr. A. S. Black, general manager and electrical engineer, states that the income rose from £63,410 to £67,859. The expenditure totalled £49,672, as against £48,235. The gross profit was £18,187, the net profit being £4,461. The average total revenue per car mile was 12.573d.

**Continued Progress at West Ham.**—The tramway accounts for the year ended March 31 show a revenue of £324,102, as against £314,751 for the preceding year. Working expenses increased from £258,518 to £267,308. The net surplus was £13,665, as compared with £16,454. West Ham Corporation undertook the modernisation of its cars at an early date, and during the past year £13,402 was spent on cars.

**Improved Results at South Shields.**—During the present financial year the traffic revenue of South Shields Corporation tramways and omnibuses has increased by more than £1,000, while the expenses have decreased by £500. Despite the unsettled weather the August Bank Holiday traffic showed an increase as compared with the corresponding occasion last year, and there were nearly 30,000 additional passengers during three days.

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**Grimsby Tramways Committee** has transferred the net surplus of £3,718 for the year to the reserve fund.

**Eastbourne Corporation Omnibuses.**—In his annual report Mr. F. Ellison, manager of the Eastbourne Omnibus Department, states that there is a net profit of £6,439, as compared with £3,618 in the corresponding period of the previous year. The gross revenue amounted to £81,686, an increase of £2,197, and constitutes a record. The price of petrol, as compared with the previous year, has greatly increased, the average price being 12.72d. per gallon, as against 10.2d. The actual increase in expenditure on petrol was £1,728.

**Sheffield Corporation Tramways.**—The annual report of Sheffield Corporation Tramways, Motors and Central Garage shows a balance on the year's working of £94,101, of which £21,742 was on motor omnibuses. The gross profit was £222,789, of which £18,307 has been transferred to the accumulated surplus fund, which now stands at £65,548. The total income from motor omnibuses was £185,684, and there was a gross balance of £21,742, which is required for various appropriations. At the department's workshops twenty additional cars are to be constructed during the present financial year.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name. | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. | Aug. 12 | 629 | 620 | — 9 | 19 | 11,038 | — 217 |
| „ Motor Buses | „ 12 | 251 | 343 | + 92 | 19 | 5,593 | + 927 |
| „ Total | „ 12 | 880 | 963 | + 83 | 19 | 16,681 | + 710 |
| Aberdeen Corp. | „ 6 | 5,821 | 6,422 | + 601 | 9½ | 55,294 | + 151 |
| Ashton-u-Lyne Corp. | „ 2 | 882 | 848 | — 34 | 18 | 15,369 | — 1,146 |
| „ Motor Buses | „ 2 | 500 | 506 | + 6 | 18 | 9,030 | + 13 |
| „ Trolley Buses | „ 2 | 254 | 247 | — 7 | 18 | 4,705 | — 355 |
| „ Total | „ 2 | 1,636 | 1,601 | — 35 | 18 | 29,104 | — 1,488 |
| Ayr Corporation | „ 9 | 925 | 874 | — 51 | 12 | 8,606 | — 714 |
| Barrow Corporation | „ 2 | 654 | 655 | + 1 | 18 | 10,598 | — 784 |
| „ Motor Buses | „ 2 | 466 | 495 | + 29 | 18 | 7,374 | + 942 |
| „ Total | „ 2 | 1,120 | 1,150 | + 30 | 18 | 17,972 | + 158 |
| Belfast City | „ 8 | 10,811 | 10,984 | + 173 | 18½ | 213,106 | + 7,858 |
| „ Motor Buses | „ 8 | 943 | 1,199 | + 256 | 18½ | 24,483 | + 5,208 |
| „ Total | „ 8 | 11,754 | 12,183 | + 429 | 18½ | 237,589 | + 13,066 |
| Birkenhead Corp. | „ 10 | 2,129 | 1,455 | — 674 | 19 | 29,870 | — 2,787 |
| „ Motor Buses | „ 10 | 9,773 | 4,708 | — 5,065 | 19 | 69,769 | + 3,445 |
| „ Total | „ 10 | 11,902 | 6,163 | — 5,739 | 19 | 99,639 | — 6,232 |
| Birmingham Corp. | July 29 | 27,335 | 25,840 | — 1,495 | 17 | 456,580 | — 9,778 |
| „ Motor Buses | „ 29 | 13,275 | 14,968 | + 1,693 | 17 | 263,170 | + 44,290 |
| „ Trolley Buses | „ 29 | 559 | 523 | — 36 | 17 | 9,496 | + 72 |
| „ Total | „ 29 | 41,169 | 41,331 | + 162 | 17 | 729,246 | + 34,584 |
| Blackburn Corp. | Aug. 6 | 2,526 | 1,798 | — 728 | 19¾ | 33,886 | — 2,892 |
| Bradford Corporation | „ 9 | 14,856 | 13,914 | — 942 | 19 | 270,587 | — 11,875 |
| Brighton Corporation | „ 10 | 5,235 | 5,101 | — 134 | 18¾ | 53,947 | + 1,999 |
| Burnley Corporation | „ 9 | 3,101 | 2,959 | — 142 | — | ... | — |
| „ Motor Buses | „ 9 | 619 | 693 | + 74 | — | ... | — |
| „ Total | „ 9 | 3,720 | 3,652 | — 68 | ... | ... | — |
| Burton-on-Trent Corp. | „ 10 | 881 | 891 | + 10 | 19 | 16,131 | + 566 |
| Bury Corporation | „ 10 | 1,950 | 1,802 | — 148 | 18¾ | 34,736 | — 4,490 |
| „ Motor Buses | „ 10 | 521 | 1,092 | + 571 | 18¾ | 20,789 | + 12,922 |
| „ Total | „ 10 | 2,471 | 2,894 | + 423 | 18¾ | 55,525 | + 8,432 |
| Cardiff Corp. | „ 2 | 7,502 | 7,891 | + 389 | 17½ | 138,887 | + 2,978 |
| Chatham and District | July 31 | 1,255 | 1,237 | — 18 | 30 | 34,104 | + 1,036 |
| Chester Corporation | Aug. 10 | 488 | Nil | — 488 | 19 | Nil | — 8,536 |
| „ Motor Buses | „ 10 | Nil | 736 | + 736 | 19 | 12,629 | + 12,629 |
| „ Total | „ 10 | 488 | 736 | + 248 | 19 | 12,629 | + 4,093 |
| Chesterfield Corp. | „ 11 | 2,170 | 2,199 | + 29 | 19 | 36,058 | + 1,104 |
| Colchester Corp. | „ 13 | 617 | 684 | + 67 | 20 | 12,233 | + 1,384 |
| Colne Corporation | „ 6 | 718 | 708 | — 10 | 18 | 13,018 | — 84 |
| Coventry Corporation | „ 10 | 2,046 | 1,846 | — 200 | 19 | 38,364 | — 2,377 |
| „ Motor Buses | „ 10 | 1,570 | 1,752 | + 182 | 19 | 34,569 | + 4,707 |
| „ Total | „ 10 | 3,616 | 3,598 | — 18 | 19 | 72,933 | + 2,330 |
| Darlington Corp. | „ 9 | 973 | 1,057 | + 84 | 18¾ | 20,083 | + 1,858 |
| Derby Corporation | „ 9 | 2,740 | 2,677 | — 63 | 19 | 46,574 | — 903 |
| „ Motor Buses | „ 9 | 791 | 929 | + 138 | 19 | 17,308 | + 4,089 |
| „ Total | „ 9 | 3,531 | 3,606 | + 75 | 19 | 63,882 | + 3,186 |
| Dover Corporation | „ 9 | 624 | 611 | — 13 | 19 | 8,031 | + 246 |
| Dundee Corporation | July 29 | 2,280 | 2,412 | + 132 | 10¾ | 27,744 | — 708 |
| „ Motor Buses | „ 29 | 732 | 1,222 | + 490 | 10¾ | 11,519 | + 2,576 |
| „ Total | „ 29 | 3,012 | 3,634 | + 622 | 10¾ | 39,263 | + 1,868 |
| East Ham Corp. | Aug. 9 | 2,296 | 2,170 | — 126 | 18¾ | 43,083 | + 686 |
| Edinburgh Corp. | „ 2 | 13,542 | 15,327 | + 1,785 | 11¾ | 178,039 | + 3,115 |
| „ Motor Buses | „ 2 | 3,180 | 3,770 | + 590 | 11¾ | 44,823 | + 3,577 |
| „ Total | „ 2 | 16,722 | 19,097 | + 2,375 | 11¾ | 222,862 | + 6,692 |
| Exeter Corporation | „ 13 | 945 | 797 | — 148 | 20 | 16,300 | — 881 |
| „ Motor Buses | „ 13 | 179 | 409 | + 230 | 20 | 5,852 | + 3,230 |
| „ Total | „ 13 | 1,124 | 1,206 | + 82 | 20 | 22,152 | + 2,349 |
| Glasgow Corporation | „ 2 | 42,082 | 37,676 | — 4,406 | 9 | 382,052 | + 2,178 |
| „ Motor Buses | „ 2 | 5,152 | 6,692 | + 1,540 | 9 | 70,884 | + 27,698 |
| „ Total | „ 2 | 47,234 | 44,368 | + 2,866 | 9 | 452,936 | + 29,876 |
| Gloucester Corp. | „ 6 | 671 | 833 | + 162 | 18¾ | 13,095 | + 2,895 |
| Grimsby Corporation | „ 9 | 2,008 | 1,968 | — 40 | 19 | 29,755 | + 3,396 |
| Halifax Corporation | „ 5 | 4,697 | 5,321 | + 624 | 18½ | 94,911 | + 11,089 |
| Huddersfield Corp. | „ 9 | 6,359 | 6,313 | — 36 | 19 | 121,022 | — 1,498 |
| Hull Corporation | „ 9 | 5,751 | 5,278 | — 473 | 19 | 107,758 | — 1,853 |
| „ Motor Buses | „ 9 | 1,449 | 1,757 | + 308 | 19 | 28,875 | + 3,873 |
| „ Total | „ 9 | 7,200 | 7,035 | — 165 | 19 | 136,633 | + 2,020 |
| Ilford Corporation | „ 9 | 1,483 | 1,410 | — 73 | 18¾ | 28,578 | + 525 |
| Ipswich Corp. Trol.Bus | „ 9 | 1,533 | 1,538 | + 5 | 18¾ | 25,424 | + 1,496 |
| Isle of Thanet | „ 6 | 2,805 | 2,460 | — 345 | 31½ | 22,836 | — 1,775 |
| Kilmarnock Corp. | „ 9 | 387 | 381 | — 6 | 12½ | 6,061 | + 269 |
| Lancashire Un. | „ 3 | 2,211 | 2,078 | — 133 | 30¾ | 65,702 | — 3,458 |
| „ Motor Buses | „ 3 | 4,790 | 5,535 | + 736 | 30¾ | 149,779 | + 21,567 |
| Leeds Corporation | „ 9 | 17,701 | 17,239 | — 362 | 18¾ | 376,946 | + 8,724 |
| Leicester Corp. | „ 9 | 7,280 | 7,154 | — 126 | 19 | 157,897 | + 961 |
| Lincoln Corp. | July 20 | 957 | 919 | — 38 | 16 | 14,840 | + 41 |
| Liverpool Corp. | Aug. 9 | 32,377 | 30,399 | + 1,978 | 18¾ | 567,225 | + 1,352 |
| London County Coun. | „ 13 | 78,888 | 77,106 | — 1,782 | 19½ | 1,596,311 | — 11,916 |
| Luton Corporation | „ 6 | 396 | 396 | Nil | 18½ | 7,949 | + 348 |
| Maidstone Corp. | „ 7 | 193 | Nil | — 193 | 18¾ | Nil | — 4,484 |
| „ Motor Buses | „ 7 | 373 | 294 | — 79 | 18¾ | 5,172 | + 78 |
| „ Trolley Buses | „ 7 | 325 | 653 | + 328 | 18¾ | 11,516 | + 5,704 |
| „ Total | „ 7 | 891 | 977 | + 56 | 18¾ | 16,688 | + 1,232 |
| Manchester Corp. | „ 2 | 32,666 | 31,235 | — 1,431 | 18 | 577,539 | — 49,621 |
| „ Motor Buses | „ 2 | 4,765 | 8,529 | + 3,764 | 18 | 154,189 | + 64,382 |
| „ Total | „ 2 | 37,431 | 39,764 | + 2,333 | 18 | 731,728 | + 14,761 |
| Middlesbrough Corp. | July 29 | 1,096 | 972 | — 124 | 17½ | 18,141 | — 1,205 |
| „ Motor Buses | „ 29 | 491 | 584 | + 93 | 17½ | 9,827 | + 1,108 |
| „ Total | „ 29 | 1,587 | 1,556 | — 31 | 17½ | 27,968 | — 97 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks. | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty.Corp. | Aug. 9 | 10,406 | 8,508 | — 1,898 | 18¾ | 165,268 | — 23,595 |
| „ Motor Buses | „ 9 | 2,285 | 3,694 | + 1,409 | 18¾ | 57,640 | + 18,823 |
| „ Total | „ 9 | 12,691 | 12,202 | — 489 | 18¾ | 222,908 | — 4,772 |
| Newport Corporation | „ 2 | 1,693 | 1,620 | — 73 | 18 | 28,606 | — 1,142 |
| „ Motor Buses | „ 2 | 737 | 809 | + 72 | 18 | 14,440 | + 1,081 |
| „ Total | „ 2 | 2,430 | 2,429 | — 1 | 18 | 43,046 | — 61 |
| Northampton Corp. | „ 1 | 1,164 | 1,141 | — 23 | 17½ | 19,383 | — 413 |
| „ Motor Buses | „ 1 | 703 | 739 | + 36 | 17½ | 12,799 | + 1,360 |
| „ Total | „ 1 | 1,867 | 1,880 | + 13 | 17½ | 32,182 | + 957 |
| Nottingham Corp. | „ 7 | 6,719 | 5,848 | — 871 | 18¾ | 107,643 | — 15,050 |
| „ Motor Buses | „ 7 | 2,365 | 3,501 | + 1,136 | 18¾ | 61,581 | + 19,793 |
| „ Trolley Buses | „ 7 | 534 | 1,175 | + 641 | 18¾ | 22,299 | + 11,373 |
| „ Total | „ 7 | 9,618 | 10,524 | + 906 | 18¾ | 191,523 | + 15,116 |
| Oldham Corporation | „ 9 | 3,360 | 3,354 | — 6 | 20 | 66,786 | — 4,794 |
| „ Motor Buses | „ 9 | 2,068 | 2,022 | — 46 | 20 | 40,047 | — 1,008 |
| „ Total | „ 9 | 5,428 | 5,376 | — 52 | 20 | 106,833 | — 5,802 |
| Plymouth Corp. | „ 2 | 3,722 | 3,866 | + 144 | 17¾ | 65,134 | — 1,963 |
| „ Motor Buses | „ 2 | 1,927 | 2,647 | + 720 | 17¾ | 43,010 | + 9,153 |
| „ Total | „ 2 | 5,649 | 6,513 | + 864 | 17¾ | 108,144 | + 7,190 |
| Portsmouth Corp. | „ 9 | 7,389 | 7,655 | — 266 | 19 | 80,933 | — 5,613 |
| „ Motor Buses | „ 9 | 2,993 | 4,675 | + 1,682 | 19 | 63,971 | + 25,639 |
| „ Total | „ 9 | 10,382 | 12,330 | + 1,948 | 19 | 144,904 | + 20,026 |
| Preston Corporation | „ 6 | 1,788 | 1,740 | — 48 | 18¾ | 30,757 | — 1,503 |
| „ Motor Buses | „ 6 | 522 | 548 | + 26 | 18¾ | 9,557 | + 625 |
| „ Total | „ 6 | 2,310 | 2,288 | — 22 | 18¾ | 40,314 | — 878 |
| Rawtenstall Corp. | „ 10 | 878 | 669 | — 209 | 18½ | 12,307 | — 3,635 |
| „ Motor Buses | „ 10 | 508 | 722 | + 214 | 18½ | 13,194 | + 3,147 |
| „ Total | „ 10 | 1,386 | 1,391 | + 5 | 18½ | 25,501 | — 488 |
| Reading Corporation | „ 7 | 1,637 | 1,575 | — 62 | 19 | 26,767 | — 1,139 |
| „ Motor Buses | „ 7 | 1,120 | 1,127 | + 7 | 19 | 18,942 | + 1,904 |
| „ Total | „ 7 | 2,757 | 2,702 | — 55 | 19 | 45,709 | + 765 |
| Rochdale Corp. | „ 9 | 2,880 | 2,839 | — 41 | — | 51,933 | — 5,268 |
| „ Motor Buses | „ 9 | 1,596 | 1,543 | — 53 | — | 29,518 | + 241 |
| „ Total | „ 9 | 4,476 | 4,382 | — 94 | ... | 81,581 | — 5,027 |
| Rotherham Corp. | „ 4 | 2,810 | 2,629 | — 181 | 18 | 49,585 | + 1,972 |
| Salford Corporation | „ 10 | 10,875 | 10,072 | — 803 | 18¾ | 212,253 | + 1,876 |
| Sheffield Corp. | „ 9 | 21,689 | 19,538 | — 2,150 | 18¾ | 370,004 | — 6,143 |
| Southampton Corp. | „ 6 | 4,912 | 4,108 | + 96 | 19 | 64,285 | + 1,472 |
| „ Motor Buses | „ 6 | 930 | 940 | + 10 | 19 | 16,245 | + 2,324 |
| „ Total | „ 6 | 4,942 | 5,048 | + 106 | 19 | 80,530 | + 3,796 |
| Southend-on-Sea Corp. | „ 13 | 3,476 | 3,170 | — 306 | 19¾ | 43,878 | — 2,441 |
| „ Trolley Buses | „ 13 | 427 | 480 | + 53 | 19¾ | 6,259 | + 2,633 |
| „ Total | „ 13 | 3,903 | 3,650 | — 254 | 19¾ | 50,138 | + 192 |
| Southport Corp. | „ 9 | 1,954 | 1,858 | — 96 | 18¾ | 25,952 | — 205 |
| „ Motor Buses | „ 9 | 578 | 657 | + 79 | 18¾ | 8,343 | + 906 |
| „ Total | „ 9 | 2,532 | 2,515 | + 17 | 18¾ | 34,295 | + 701 |
| St. Helens Corp. | „ 5 | 2,195 | 2,276 | + 81 | 18¼ | 37,254 | + 2,362 |
| Sunderland Corp. | „ 12 | 2,808 | 2,815 | + 7 | 19 | 49,164 | + 1,856 |
| „ Motor Buses | „ 12 | 359 | 659 | + 300 | 19 | 6,653 | + 5,974 |
| „ Total | „ 12 | 3,167 | 3,474 | + 307 | 19 | 55,817 | + 7,830 |
| Swindon Corp. | „ 6 | 1,052 | 1,131 | — 79 | 18¾ | 18,020 | + 4,124 |
| Wallasey Corp. | „ 9 | 1,770 | 1,563 | — 207 | 18½ | 24,100 | — 2,052 |
| „ Motor Buses | „ 9 | 3,623 | 3,369 | — 254 | 18¾ | 45,811 | + 4,234 |
| „ Total | „ 9 | 5,393 | 4,932 | — 461 | 18¾ | 69,911 | + 2,182 |
| Walsall Corporation | „ 3 | 3,428 | 3,447 | + 19 | 18 | 62,125 | + 1,531 |
| Walthamstow Corp. | „ 9 | 2,511 | 2,362 | — 149 | 18¾ | 46,784 | — 7 |
| Warrington Corp. | „ 7 | 861 | 847 | + 14 | 19 | 16,745 | + 36 |
| „ Motor Buses | „ 7 | 448 | 492 | + 44 | 19 | 9,507 | + 1,134 |
| „ Total | „ 7 | 1,309 | 1,339 | + 30 | 19 | 26,352 | + 1,170 |
| West Ham Corp. | „ 7 | 6,060 | 5,773 | + 287 | 18¾ | 112,617 | + 2,252 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses | „ 3 | 2,769 | 2,477 | — 292 | 18 | 43,745 | — 6,615 |
| „ Trolley Buses | „ 3 | 3,290 | 3,434 | — 144 | 18 | 63,362 | + 3,795 |
| „ Total | „ 3 | 6,059 | 5,911 | — 148 | 18 | 107,107 | — 2,820 |
| York Corporation | „ 6 | 1,079 | 1,074 | — 5 | 19 | 19,351 | — 23 |
| „ Motor Buses | „ 6 | 412 | 534 | + 122 | 19 | 9,397 | + 2,455 |
| „ Trolley Buses | „ 6 | 44 | Nil | — 44 | 19 | Nil | — 953 |
| „ Total | „ 6 | 1,535 | 1,608 | + 73 | 19 | 28,748 | + 1,479 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or *M* | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Aug. 12 | £84,606 | £80,394 | 32 w | £2,657,735 | — £109,645 |
| Brazilian Traction $ | June | 4,210,893 | 4,146,884 | 6 m | 24,286,359 | + 249,334 |
| British Columbia $ | June | 1,133,017 | 1,144,585 | 12 m | 14,658,732 | + 610,860 |
| Buenos Aires Lacroze | Aug. 10 | 11,338 | 10,880 | 6 w | 62,068 | — 6,057 |
| Burma E. Sup. Co. Rs. | June | 63,157 | 66,317 | 11 m | 709,845 | — 18,866 |
| Calcutta ... Rs. | Aug. 9 | 126,048 | 108,338 | 31½ w | 3,546,921 | — 483,283 |
| Cape Town ... ... | June | 27,995 | 25,525 | ... | ... | ... |
| Carthagena & Herrerias | July | 1,100 | 738 | 7 m | 6,350 | — 571 |
| Durban Corporation | June | 24,308 | 23,440 | 11 m | 261,923 | — 1,582 |
| East India ... ... | July | 3,801 | 3,833 | 12 m | 45,460 | + 470 |
| Kalgoorlie ... ... | Apr. | 1,673 | 1,718 | 4 m | 6,319 | Nil |
| Madras (2 weeks) Rs. | July 31 | 42,239 | 45,091 | 30 w | 646,057 | + 33,452 |
| Para ... ... | June | 15,450 | 15,028 | 7 m | 103,807 | + 749 |
| Port Elizabeth ... | June | 7,335 | 6,951 | ... | ... | ... |
| Rangoon ... Rs. | July | 122,630 | 151,300 | 7 m | 1,050,935 | + 219,494 |
| Shanghai ... $ | June | 335,740 | 367,231 | 6 m | 1,923,202 | — 42,708 |
| Singapore ... ...$ | July | 131,000 | 145,000 | 10 m | 1,368,000 | + 154,000 |
| Winnipeg ... ...$ | June | 517,738 | 479,958 | 6 m | 3,273,504 | — 66,574 |

## RAILWAY RECEIPTS.

| 32nd Week ended Aug. 10th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 379,000 | — 26,000 | 204,000 | — 22,000 | 583,000 | — 48,000 | — 833,000 |
| L.M.S.R. | 748,000 | — 94,000 | 560,000 | — 79,000 | 1,308,000 | — 173,000 | -2,471,000 |
| L.N.E.R. | 513,000 | — 36,000 | 509,000 | — 86,000 | 1,022,000 | — 122,000 | -1,471,000 |
| S.R. | 463,000 | — 28,000 | 83,000 | — 2,000 | 546,000 | — 30,000 | — 255,000 |
| Totals | 2,103,000 | — 184,000 | 1,356,000 | — 189,000 | 3,459,000 | — 373,000 | -5,030,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Aug. 9 | 295,000 | 293,700 | — 1,300 | 9,652,100 | + 588,700 |
| Lond. & Sub. Group | „ 9 | 45,600 | 44,200 | — 1,400 | 1,411,300 | + 97,700 |
| Metropolitan Railway | „ 9 | 36,400 | 35,400 | — 1,000 | 1,177,300 | + 23,500 |
| Liverpool Overhead | „ 10 | 2,523 | 1,825 | — 698 | 50,003 | — 3,403 |
| Mersey Railway ... | „ 9 | 4,734 | 4,268 | — 466 | 145,897 | + 3,906 |

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LONDON, AUGUST 23, 1930.

## THE TROLLEYBUS.

In travelling about the country, the changing character of city passenger transport becomes more evident with the extension of trolleybus systems. The almost noiseless movement of these modern vehicles, coupled with their mobility and ease of loading at the kerb, have taken the favour of the travelling public to an encouraging extent. But for the slight hum of the motor as it gathers speed, one is impressed with the quiet and unostentatious manner with which the trolleybus proceeds from stage to stage. Particularly is this the case when ascending steep gradients. Compared with the noise of the petrol engine and the crashing of gears the effortless ease of the electric vehicle as it tops the rise points to a factor in modern transport that municipalities are not slow to recognise. The recent congress at Hastings gave the industry an opportunity of studying at first hand the physical side of the trolleybus system. Even had detailed operating figures been issued, it is doubtful whether any conclusions could have been safely drawn without comparative figures for other competitive types of passenger transport. It is therefore interesting to consider the actual results from a pioneer in this field, side by side with 'buses of the petrol type. The Wolverhampton Corporation Tramways report for 1929 is sufficiently striking to justify a close analysis by every transport manager. With an almost equal number of trolley and petrol 'buses the trolleybus shows gross profits of £75,271 and motor 'buses £26,236. Having in mind that there are actually more motor 'buses than trolleybuses, the latter carried 23,176,000 passengers against 16,522,400. It is true that the motor 'bus passengers are gained from the outer sections and do not compete wholly in the town proper. On the other hand, it might be expected that the longer distances would to some extent compensate, and a useful graph shows the motor 'bus to have 20 per cent. more passengers at the higher fares. It is when the comparative operating costs are noted that the case for the trolleybus is so markedly shown. An operating ratio of 58.15 per cent. compared with motor 'buses of 80.38 per cent., with mileages of 2,419,762 and 2,251,607 respectively, is eloquent. With total working expenses of the trolleybus of 10.38d. per mile against 12.29d. of the motor 'bus, the comparison would appear to be clear. Yet we are assured that had the motor 'bus to operate the short stage conditions in the city the low gear work and higher fuel consumption, apart from heavier maintenance, would have considerably increased this figure of 12.29d. The cost of power per mile is 1.433d. for the trolley vehicle and 2.955d. for the motor 'bus. Comparing results for the year previous, it appears that the total working costs for the trolleybus have dropped 0.375d., whilst the motor 'buses have increased 0.170d. This is not wholly due to the rise in cost of petrol, as there are decreases in wages and in other directions. The Wolverhampton Transport Management may be congratulated on the excellent results of a system requiring at the date of initiation considerable enterprise, and through the early years of operation a courage and persistence to achieve an aim which practical results to-day have vindicated so strikingly. For municipal transport systems in general it provides facts and data upon which their own generating stations are involved when brought to a consideration of costly track renewals and the choice of an alternative transport system.

## GLASGOW CORPORATION TRANSPORT.

### A DEBT-FREE UNDERTAKING.

In our issue of August 9 it was reported that Glasgow's municipal transport undertaking was almost free from debt. The annual accounts now to hand for the year ended May 31 give full details of the results, including the tramways, omnibus and subway sections. A financial summary shows that, with the exception of 1928, the past year was the most successful in the history of the undertaking. The total capital outlay on the system up to May 31 was £8,019,743. The loan debt stood at £3,388,060, but against this the depreciation and renewals fund reached the huge total of £3,387,992, and with £91,732 in general reserve and other funds, there was a surplus of £91,664. Since the Corporation began to operate the system it has paid to the "Common Good Fund" £1,216,504, and to city and county rates £2,718,144.

### TRAMWAYS DEPARTMENT.

The total income from the tramways was £2,317,627, and the working expenses were £1,689,035, leaving a net revenue of £628,592. Interest on investments brought this figure to £758,906, and after deducting interest, sinking fund, income tax, Parliamentary expenses, depreciation fund, and permanent way renewals fund, there was a surplus of £8,136, but the deficit on the subway section of £25,277 makes the tramways show a deficit of £17,141. The gross revenue for the year increased by £60,015 compared with the previous year. During the year £250,138 was set aside out of the year's revenue for renewal of track, calculated at £900 per mile, and £130,844 was spent on ordinary repairs to the track. The average traffic revenue per car mile decreased from 15.543d. to 15.475d., and while the working expenses increased by £5,027, the average per mile was only 11.302d. compared with 11.480d. The car mileage was 35,867,856, the mileage open, in single track, being 270¾. The average number of cars in use was 818, and the passengers totalled 470,020,925. The number of passengers per car mile was 13.10, and the average fare paid was 1.181d.

### OMNIBUSES.

In the omnibus section the revenue for the year was £349,736, and the working expenses were £272,280, leaving a balance of £77,456. Deducting £75,893 for interest, sinking fund and depreciation, there was a balance of £1,563. The total capital expenditure at May 31 was £421,237. The number of omnibuses in stock was 201, and of the last 100 ordered 38 had still to be delivered by the makers. The cost of maintenance during the year was £59,117, and £60,982 was charged against revenue for depreciation. The number of passengers carried was 48,066,753, of whom 36.47 per cent. represented penny fares. In the previous year the passengers numbered 25,220,710, which shows how the traffic has grown. The average traffic revenue per omnibus mile was 15.060d. compared with 14.476d., and the average working expenses per omnibus mile was 11.741d. compared with 10.407d.

The total staff of the undertaking at May 31 numbered 8,624, of whom 7,379 were employed on the tramways, 855 on the omnibuses, and 390 in the subway section. The wages paid for the year totalled £1,337,836.

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## NEWCASTLE CORPORATION TRANSPORT.

The annual report of Mr. T. P. Easton, general manager of Newcastle-upon-Tyne Corporation Transport, shows that for the year ended March 31 the income of the tramways was £493,584 and working expenses £353,442, leaving a gross profit of £140,142. Deducting interest and other charges the net profit was £36,816. The receipts increased by £19,924 compared with the previous year. This is attributed to the North-East Coast Exhibition. Passengers numbered 95,686,328. The traffic revenue per car mile was 17.105d., the average fare per passenger was 1.272d., and the operating costs per car mile 12.429d., compared with 13.064d. last year. Two routes totalling 1¾ miles were closed down and omnibuses substituted.

The omnibus section had an income of £108,169, compared with £96,346; working expenses were £101,142, compared with £90,472, leaving a gross profit of £7,027. Deducting interest and other charges, £13,448, there was a net loss of £6,420, compared with a loss of £7,746. On the combined systems there was thus a net profit of £30,395. The omnibus fleet consists of 58 single-deck and 14 double-deck vehicles. The capital expenditure in the omnibus section amounts to £95,947, and the debt outstanding is £63,302. Omnibus passengers numbered 11,135,707; the average fare per passenger was 2.320d., and the average receipts per omnibus mile were 8.705d.

## NEW TROLLEYBUS ROUTE IN BELGIUM.

A new trolleybus service, Liége—Cointe, was opened on August 9 by the Société Anonyme des Tramways Unifiés de Liége. The service is provided by five vehicles supplied by Ransomes, Sims and Jefferies, Ltd., of Ipswich. These vehicles are of the four-wheel single-deck saloon type, and were built throughout at the firm's works at Ipswich. The bodies have seats for 30 passengers and there is standing room for a further 30. The vehicles are arranged for either one or two-man operation and are all fitted with Englebert S.S. pneumatic tyres.

The official inauguration of the route was attended by the Chief of the Belgian Ministry of Transport and many of the leading tramway officials in Belgium. M. Harmel, Director-General of the Tramways Unifiés de Liége, stated that the new trolleybus route had actually been in operation very successfully since July 30 with a 15 minutes' service in the mornings and a 10 minutes' service in the afternoons.

## GLASGOW ORDERS 100 OMNIBUSES.

Glasgow City Corporation on Thursday sanctioned the expenditure of £163,575 on the provision of one hundred double-deck motor omnibuses for the Tramways and Omnibus Department. The contracts were placed as follow: Leyland Motors, Ltd., Leyland, Lancs, 75 chassis at £950 each; Vulcan Motor and Engineering Co., Ltd., Southport, 25 chassis at £933 each; Cowieson & Co., Glasgow, 100 bodies at £690 each.

## RECENT PUBLICATIONS.

We have received from the English Electric Co., Ltd., Queen's House, Kingsway, London, W.C.2, the following leaflets: M.22, Railway Electrification in South Africa; M.23, Railway Electrification in India; 838A, Kiosk Type Sub-Stations.

To the August issue of the EDGAR ALLEN NEWS Mr. V. G. Pearson, of the steel foundry department of the company, contributes an interesting article on "Electric Welding of Mild Steel by the Metal Arc Process." There is also an article on "Machining Manganese Steel."

Tangyes, Limited, of Birmingham, have issued illustrated folders describing their latest two-stroke vertical fuel oil engine. It has been specially designed to use cheap fuel oils, and the cost of running is remarkably low, especially in comparison with petrol or paraffin. We shall describe this engine in a future issue.

## AN ELECTRICAL TRADE SURVEY.

The British Electrical and Allied Manufacturers' Association has published a trade survey (price 10s. 6d.) which deals with the causes of the world economic crises and indicates signs of trade recovery. The three causes given are as follow: (1) reparations, (2) the shortage of gold and the inelastic and unequable operation of the gold standard, and (3) the fall in commodity prices. The writers of the "survey" find it interesting to discover that financial opinion in this country, under the bankers' manifesto, is a sound indication of the move away from the conception of free trade to the conception of imperial co-operation based on the protectionist system. They find that the reparation operates merely for the benefit of France and the United States, and consider that it must ultimately be abolished if prosperity is to return to the world as a whole and the gold standard to be made to function properly. British industry, including the electrical industry, is considered to be at the beginning of a new period, and there is reason to believe that after the present depression is surmounted, a future of real expansion will follow.

**Tynemouth Tramways.**—A draft agreement providing for the abandonment of the Tynemouth Tramways has been submitted by the Tynemouth and District Electric Traction Co. to the Tynemouth Watch Committee, and has been referred to a sub-committee.

## MISCELLANEOUS NEWS AND NOTES.

**Glasgow Transport Committee** is considering the erection of a motor omnibus garage in the Anniesland district.

**Omnibus's 37 Miles per Hour.**—A driver was fined £5 at Penrith for driving an omnibus at 37 miles per hour on the Penrith-Carlisle road.

**Ashton-under-Lyne Tramways Committee** is to consider the reorganisation of the tramway services as certain routes are not paying.

**Employees' Holidays at Burnley.**—The employees of the Burnley Tramways Department have asked for their eight days' holiday to be extended to twelve days.

**Tramcars for the Test Match.**—Nearly 400 L.C.C. tramcars per hour were running to Kennington Oval during the progress of the Test match since August 16.

**Experimental Car at Nottingham.**—A new tramcar is running in Nottingham for experimental purposes. It has leather upholstery, cork floors, and a white ceiling.

**New Cars for Belfast.**—Belfast Tramways Committee has decided to order 50 new tramcars. These will be of the most recent type, and will be equipped with special air brakes.

**Dust Coats for Transport Workers.**—The tramway and omnibus men in the employ of Nottingham Corporation have been supplied with dust coats and cap covers for the summer months.

**Pensioners' Passes Extended.**—Liverpool Tramways Committee has extended the availability of free tramcar passes for old-age pensioners for a further three months, expiring on November 30.

**Road Accidents.**—During the week-end August 16-17, it was reported that twenty persons were killed and 52 injured in road accidents. On August 16 fifteen persons were killed and 61 injured in road accidents in France.

**Omnibus Route Substituted at Newport.**—On August 18 a corporation omnibus service was started on Chepstow-road, Newport, in substitution of the tramways. Double-deck omnibuses carrying 48 passengers are being used.

**Suggested Shorter Stages at Salford.**—A sub-committee of Salford Tramways Committee is considering various ways of preventing a repetition of the loss on the tramways. It is believed that they will recommend a shortening of the fare stages.

**Leamington-Warwick Tramways Superseded.**—The tramway service between Leamington and Warwick was discontinued on August 16, omnibuses having been substituted. Work has begun at Leamington in lifting the disused track.

**Nitric Acid Explosion on an Omnibus.**—A messenger-boy was carrying a half-gallon of nitric acid on a Corporation omnibus at Newcastle on August 18, when the bottle burst. The vehicle was filled with dense fumes, and a passenger sustained burns on the hands.

**Proposed Oxford By-Pass Road.**—Representatives of the Oxford County Council and Oxford City Council have discussed with Lord Ponsonby, Parliamentary Secretary to the Ministry of Transport, a proposal for the construction of a by-pass road on the northern side of Oxford.

**Cost of Living.**—On August 1 the average level of retail prices of the commodities taken into account in the cost of living statistics compiled by the Ministry of Labour was approximately 57 per cent. above that of July, 1914, as compared with 55 per cent. a month ago and 63 per cent. a year ago.

**Goodyear Factory Extension.**—An extension is to be built to the factory of the Goodyear Tyre and Rubber Co. at Wolverhampton. It will be a two-storey and basement building 80 ft. by 140 ft., adding 33,600 sq. feet to the factory, and necessitating the employment of many additional workmen.

**Burnley Transport Employees.**—The local trade depression having necessitated a slight reduction in the main tramway service, Burnley Corporation Tramways and Omnibus Department report a surplus of 14 employees. It is proposed to reduce working hours and spread the reduction amongst the staff, so as to avoid dismissals.

**Southwark and the Elephant and Castle Scheme.**—The Southwark Borough Council has decided to oppose the L.C.C. scheme for traffic improvement at the Elephant and Castle. It is desired to obtain an undertaking that ejected residents will be rehoused within a reasonable distance and to secure the construction of subways for pedestrians.

**Trolleybuses Welcomed.**—Pontypridd Council recently placed an order for trolley omnibuses, which are to replace the tramcars on one of their routes. The Pontypridd "Observer," having seen the new trolley omnibuses, says: "We are convinced that the local authorities are about to convert Pontypridd into a sort of silent city."

**Experimental Omnibus at Sunderland.**—An experimental omnibus service is to be started by the Sunderland Corporation on August 27 along the Tatham-street route of the tramways. A new single-deck car holding 54 passengers was recently ordered for this route and it will be used to enable the public to decide whether they prefer omnibuses.

**Belfast Fares.**—At a recent meeting of Belfast Tramways Committee a report was presented with regard to the finding of the Omnibus Fares Tribunal. The decision of the Tribunal was "that the Corporation have made out a case for the abolition of the granting of return tickets on all the omnibus routes referred to, but have not made a case for increasing the ordinary single fares from what they are at present, on any of the routes." The Committee gave instructions that effect should be given to the decision as from September 1 next.

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**Railway Wages.**—The Scottish Railway Stockholders' Protection Society has sent a memorandum on the subject of railway wages to the four railway groups. The Association suggests that the directors prepare a case without delay for submission to the National Wages Board, seeking an all-round (either flat or graded) reduction in fees, salary and wages of from 5 per cent. to 10 per cent.

**Proposed Omnibuses at Stirling.**—The Town Council of Stirling has adopted a motion and remitted it to the magistrates for starting a municipal omnibus service. Judge Macintosh, the mover of the motion, said there were complaints of the service on certain local routes, and a syndicate of local people were proposing to operate omnibuses of their own, and that was why he wished the magistrates to consider the matter first.

**Wigan's Big Order for Omnibuses.**—In due course the Corporation of Wigan will seek sanction to borrow the sum of £62,700 for the purchase of the petrol omnibuses to be used in place of the tramways. It is not expected that there will be any abandonment of a tramway route until after next November. The tramway poles will be left standing for use in the event of trolleybuses being eventually selected for permanent operation.

**More Trolleybuses at Rotherham.**—According to the "Sheffield Daily Telegraph," the day is not far distant when, on most of the Rotherham routes, the tramcars will have been replaced by trolleybuses. The cars have been taken off the Rawmarsh and Broom-road routes, and steps are being taken to substitute trolleybuses on the Kimberworth, Thrybergh, and Canklow sections. Trolleybuses of a considerably improved type have also been introduced on the service to Maltby.

**175-mile Tramway Ride for 1s.**—Mr. Wilfred Westley, of Highgate-hill, has established a record for tramway travelling by riding 175 miles on the L.C.C. tramways with a shilling-all-day ride-at-will ticket. He started at 5.22 a.m., and did not finish until 2.5 a.m. the next day, as he missed the last car and had to wait for an all-night tramcar. He travelled on 31 cars, and at the ordinary single fare rates his journeys would have cost 9s. 2d. His ticket was available up to 3 a.m.

**The Drumm Electric Battery.**—Mr. W. Chamberlain, general manager of Belfast City Tramways, referring to the Drumm battery, to which reference was made in our issue of August 14, recently said to a local pressman: "We recognise that the battery is a great advance on anything yet evolved, and for city traffic purposes will be a formidable competitor of motor omnibuses on those routes where there are no rails or overhead wiring. Like all transport authorities, we are deeply interested in the experiments now proceeding in Dublin." Dublin reports state that the Dublin United Tramways Co., Ltd., may use the Drumm battery for operating tramcars should it prove as successful as is hoped.

**A Station for Green Line Coaches.**—A site in Broad-street, near Oxford-circus, has been purchased on behalf of Green Line Coaches, Ltd., for use as a motor coach station. The station is being constructed to obviate the congestion caused by coaches parking in the streets, and will provide passengers with convenient facilities for joining and leaving coaches in the central area. Green Line Coaches, Ltd., has been instituted by the London General Omnibus Co. to operate express coaches from London to the surrounding areas. The new company has been formed for convenience of operation and in order to distinguish the coaches from the single-deck omnibuses of the L.G.O.C. already operating in the outlying districts.

**Omnibus Routes Inquiry at Cardiff.**—A Ministry of Transport inquiry was held at Cardiff on August 20 into two applications concerning omnibus services. The first was by Cardiff Corporation to prolong their Ely and Llandaff route to Rhiwbina. Mr. K. Rees, deputy town clerk, said it was important for the Corporation to complete the link to form the outer circle of the city, so that anyone living on the boundaries could get to any other part of Cardiff without trouble. The application was opposed by Barry Associated Motors, who also appealed against the decision of the Cardiff Watch Committee to refuse a through licence to pick up passengers on their route from Rhiwbina to Barry Island. Mr. Rees said the tramways department would not oppose the company's application provided that between Llandaff railway station and Culverhouse Cross (which is within the city area) the Barry service would charge a minimum of 6d. single journey and 9d. return, so as not to undermine the city service over the same route. The Inspector, Mr. N. A. J. Cohen, said he would report his impressions to the Ministry.

**Glasgow Monopoly Powers.**—Although Glasgow Corporation recently obtained what has been described as a monopoly "Act" in connection with the running of omnibuses within the city, the Lanarkshire Traction Co., have given notice of an action against the Glasgow magistrates asking the Court to find that the magistrates are acting *ultra vires* in requiring the company to obtain a stage carriage certificate for their omnibuses plying within the city. It is understood that the company base their claim upon their Act of Parliament which they contend entitles them to run omnibuses a specified distance from their existing tramway lines. In the Court of Session, Edinburgh, this week, the company sought to prevent the Corporation from prosecuting them for running omnibuses in the city without certificates, pending the final decision in the action. Lord Sands, however, refused an interdict, saying he knew of no precedent for obtaining immunity for a statutory offence. It appeared, he said, that the company were willing to accept a licence with the conditions, on the understanding that this was not to prejudice them in the action.

**Law of Property Found on Tramcars.**—In a case heard at Glasgow on August 14, when a tramcar conductor was alleged to have been given a lost pochette containing a purse and money by a woman, and failed to hand it over, the stipendiary magistrate said it would be a good rule if passengers who found articles in a tramcar and handed them to the conductor, were given a receipt. The conductor, in evidence, said that if a passenger refused to hand over property found in the car he would call the police. The stipendiary said he would have no right to call the police. It would be part of the conductor's duty to take the passenger's name and address, with those of witnesses, and make a report. A passenger was not bound to give property up. He could take it to the police.

**Non-Unionist Question at Bolton.**—The threatened strike of tramway and omnibus workers at Bolton will, it is anticipated, not take place. The employees threatened to stop work on August 22 if the non-unionists, who number about a dozen, had not become members of the Transport and General Workers' Union. Mr. J. Kilcummins, an official of the Transport and General Workers' Union, has stated to a local newspaper man that "we do not anticipate the stoppage because we believe the non-unionists will have become members of the Union by August 22." Representatives of the workers recently met officials of the Corporation and, as stated by Mr. Kilcummins, employees then suggested "that it was most unfair that omnibus drivers with only a year or two of service should be working full time, while employees of more than twenty years of service were on short time."

## PERSONAL.

**Mr. S. A. Maddocks** has been appointed by the New South Wales Government as transport commissioner at a salary of £1,800 per annum.

**Mr. E. O. Milne** has been appointed chairman of the tramways and omnibus management board of New South Wales Government at a salary of £1,500 per annum.

**Mr. J. C. Fairchild,** recently appointed transport manager and electrical engineer of Lytham St. Annes Corporation, has been granted an increase of salary of £100 per annum.

**Mr. Fred. R. Purchase,** a native of Bushbury, Wolverhampton, has been appointed to an important position in the new Goodyear Tyre Factory recently built at Buenos Aires. He joined the Goodyear company at Wolverhampton as a factory hand early in 1928.

**Mr. A. W. Matheson,** chief traffic clerk of the Cardiff Tramways Department, has retired after nearly forty years' service. At a farewell gathering on August 19 Mr. William Forbes, general manager of the tramways, made presentations to Mr. and Mrs. Matheson on behalf of all sections of the department.

**Mr. Herbert Heath,** an electrician at the Townhead-street garage of the Sheffield Corporation Tramways, has won the £10 and silver medal awarded by the Municipal Tramways and Transport Association in their annual essay competition. The subject was "The layout and equipment of a garage for 100 motor omnibuses." This is the fifth year in succession that a Sheffield tramways assistant has taken an award and a medal in this competition.

## CONTRACTS.

**Gloucester Corporation** has placed a second repeat order with the Vulcan Motor & Engineering Co. for three "Duchess" 26-seat omnibuses. The first order from Gloucester was for nine "Duchess" 26-seat omnibuses; this was followed by a repeat order in November, 1929, for three more omnibuses of a similar type.

**Glasgow Transport Committee** has accepted the tender of the Edison Swan Electric Co., Ltd., for the supply of a battery for Dalmuir sub-station, and of the Brush Electrical Engineering Co., Ltd., for the supply of three transformer cases for sub-stations. The Committee has also accepted the tenders of J. B. Blakeborough & Sons, Ltd., for sluice valves, and of Messrs. Dewrance and Co. for steam valves for Pinkstone Power Station.

## FINANCIAL.

**Mackintosh Cable Co.**—The British Insulated Cables, Ltd., have acquired the interest in the Mackintosh Cable Co., hitherto held by the Dunlop Rubber Co., Ltd.

**Burnley Corporation Tramways and Omnibuses** made a gross profit for the year ended March 31 of £24,769, after deducting £3,175 loss on the omnibuses. £9,821 was spent on relaying and renewal of track.

**Rangoon Tramway Issue.**—In connection with the issue of 150,000 £1 ordinary shares by the Rangoon Electric Tramway and Supply Co., Ltd., notices have been issued to existing shareholders offering these shares on a *pro rata* basis.

**Wallasey Corporation Tramways,** which are gradually being superseded by omnibuses, had receipts totalling £66,927 for the year ended March 31 last, compared with £103,400 in the previous year. The omnibus receipts were £109,067, compared with £53,393. The net profit on the tramways was £955 and on the omnibuses £24,047.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended August 20 amounted to £80,448, an increase of £879 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to August 20 (20 2-7 weeks), the total receipts were £1,677,670, a decrease of £10,580.

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**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended August 2 give total receipts of £418,543, or £7,745 more than in the corresponding week of last year. The aggregate receipts for eighteen weeks amounted to £7,616,173, an increase of £129,750 over the corresponding period of last year.

**Glasgow Transport Estimates.**—At a meeting of the Glasgow Transport Committee the general manager, Mr. L. Mackinnon, submitted the estimates for the tramways section of the transport department for the year ending May 31, 1931, showing a surplus of £2,000. He reported that in connection with the subway section the estimate showed a loss of approximately £30,000. He was unable to give any estimate of the operating results of the omnibus section in view of the new circumstances arising out of the granting by Parliament of a monopoly of the city transport and the consequent increase that would be required in the fleet of omnibuses. The estimated capital expenditure required for the current year on the tramways amounted to £225,000, and on the omnibuses to £98,000.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | Aug. 12 | 629 | 620 | — 9 | 19 | 11,038 | — 217 |
| „ Motor Buses ... | „ 12 | 251 | 343 | + 92 | 19 | 5,593 | + 927 |
| „ Total ... ... | „ 12 | 880 | 963 | + 83 | 19 | 16,681 | + 710 |
| Aberdeen Corp. ... | „ 13 | 6,319 | 6,344 | + 25 | 10½ | 61,638 | + 176 |
| Ashton-u-Lyne Corp. | „ 9 | 974 | 878 | — 96 | 19 | 16,247 | — 1,242 |
| „ Motor Buses ... | „ 9 | 517 | 497 | — 20 | 19 | 9,527 | — 7 |
| „ Trolley Buses ... | „ 9 | 266 | 254 | — 12 | 19 | 4,959 | + 367 |
| „ Total ... ... | „ 9 | 1,757 | 1,629 | — 128 | 19 | 30,733 | — 1,616 |
| Ayr Corporation ... | „ 16 | 790 | 748 | — 42 | 13 | 9,354 | — 756 |
| Barrow Corporation... | „ 16 | 669 | 545 | — 124 | 20 | 11,825 | — 998 |
| „ Motor Buses ... | „ 16 | 559 | 453 | — 106 | 20 | 8,456 | + 814 |
| „ Total ... ... | „ 16 | 1,228 | 998 | — 230 | 20 | 20,281 | + 184 |
| Belfast City ... ... | „ 15 | 11,708 | 10,899 | — 809 | 19½ | 224,005 | + 7,049 |
| „ Motor Buses ... | „ 15 | 963 | 1,200 | + 237 | 19½ | 25,683 | + 5,445 |
| „ Total ... ... | „ 15 | 12,671 | 12,099 | — 572 | 19½ | 249,688 | + 12,494 |
| Birkenhead Corp. ... | „ 17 | 1,759 | 1,474 | — 285 | 20 | 31,345 | — 3,073 |
| „ Motor Buses ... | „ 17 | 4,658 | 4,448 | — 210 | 20 | 74,217 | — 3,656 |
| „ Total ... ... | „ 17 | 6,417 | 5,922 | — 495 | 20 | 105,562 | — 6,729 |
| Birmingham Corp. ... | „ 12 | 23,731 | 22,330 | — 1,401 | 19 | 503,386 | — 12,619 |
| „ Motor Buses ... | „ 12 | 12,723 | 13,434 | + 711 | 19 | 291,303 | + 47,687 |
| „ Trolley Buses ... | „ 12 | 463 | 463 | Nil | 19 | 10,468 | + 11 |
| „ Total ... ... | „ 12 | 36,917 | 36,227 | — 690 | 19 | 805,157 | + 35,079 |
| Blackburn Corp. ... | „ 13 | 1,963 | 1,734 | — 229 | 19½ | 35,620 | — 3,110 |
| „ Motor Buses ... | „ 13 | Nil | 311 | + 311 | 19½ | 6,252 | + 6,252 |
| „ Total ... ... | „ 13 | 1,963 | 2,045 | + 82 | 19½ | 41,872 | + 3,142 |
| Bradford Corporation | „ 16 | 13,448 | 12,881 | — 567 | 20 | 283,468 | — 12,442 |
| Brighton Corporation | „ 17 | 3,472 | 3,477 | + 5 | 19½ | 57,424 | + 2,004 |
| Burnley Corporation... | „ 16 | 2,939 | 2,799 | — 140 | — | ... | — |
| „ Motor Buses ... | „ 16 | 620 | 664 | + 44 | — | ... | — |
| „ Total ... ... | „ 16 | 3,559 | 3,463 | — 96 | ... | .. | — |
| Burton-on-Trent Corp. | „ 17 | 795 | 798 | + 3 | 20 | 16,929 | + 569 |
| Bury Corporation ... | „ 17 | 1,625 | 1,553 | — 72 | 19½ | 36,301 | — 4,562 |
| „ Motor Buses ... | „ 17 | 542 | 1,172 | + 630 | 19½ | 21,971 | + 13,561 |
| „ Total ... ... | „ 17 | 2,167 | 2,725 | + 558 | 19½ | 58,272 | + 8,999 |
| Cardiff Corporation ... | „ 2 | 7,502 | 7,891 | + 389 | 17½ | 138,887 | + 2,978 |
| Chatham and District | „ 14 | 1,538 | 1,327 | — 211 | 32 | 36,950 | + 853 |
| Chester Corporation ... | „ 17 | 439 | Nil | — 439 | 20 | Nil | — 8,975 |
| „ Motor Buses ... | „ 17 | Nil | 681 | + 681 | 20 | 13,310 | + 13,310 |
| „ Total ... ... | „ 17 | 439 | 681 | + 242 | 20 | 13,310 | + 4,335 |
| Chesterfield Corp. ... | „ 18 | 2,034 | 2,054 | + 20 | 20 | 38,092 | + 1,124 |
| Colchester Corp. ... | „ 20 | 588 | 642 | + 54 | 21 | 11,440 | + 1,435 |
| Colne Corporation ... | „ 20 | 726 | 691 | — 35 | 20 | 14,489 | — 127 |
| Coventry Corporation | „ 17 | 1,999 | 1,833 | — 166 | 20 | 40,196 | — 2,543 |
| „ Motor Buses ... | „ 17 | 1,496 | 1,667 | + 171 | 20 | 36,236 | + 4,878 |
| „ Total ... ... | „ 17 | 3,495 | 3,500 | + 5 | 20 | 76,432 | + 2,335 |
| Darlington Corp. ... | „ 16 | 957 | 1,022 | + 65 | 19½ | 21,105 | + 1,922 |
| Derby Corporation ... | „ 16 | 2,604 | 2,431 | — 173 | 20 | 49,005 | — 1,077 |
| „ Motor Buses ... | „ 16 | 795 | 921 | + 126 | 20 | 18,230 | + 4,215 |
| „ Total ... ... | „ 16 | 3,399 | 3,352 | — 47 | 20 | 67,235 | + 3,138 |
| Dover Corporation ... | „ 16 | 579 | 573 | — 6 | 20 | 8,604 | + 240 |
| Dundee Corporation... | „ 5 | 2,517 | 2,224 | — 293 | 11½ | 29,967 | — 1,002 |
| „ Motor Buses ... | „ 5 | 785 | 1,115 | + 330 | 11½ | 12,635 | + 2,908 |
| „ Total ... ... | „ 5 | 3,302 | 3,339 | + 37 | 11½ | 42,602 | + 1,906 |
| East Ham Corp. ... | „ 16 | 2,305 | 2,305 | Nil | 19½ | 45,388 | + 710 |
| Edinburgh Corp. ... | „ 9 | 13,515 | 14,954 | + 1,439 | 12½ | 192,993 | + 4,554 |
| „ Motor Buses ... | „ 9 | 3,323 | 3,763 | + 440 | 12½ | 48,586 | + 4,016 |
| „ Total ... ... | „ 9 | 16,838 | 18,717 | + 1,879 | 12½ | 241,579 | + 8,570 |
| Exeter Corporation ... | „ 13 | 945 | 797 | — 148 | 20 | 16,300 | — 881 |
| „ Motor Buses ... | „ 13 | 179 | 409 | + 230 | 20 | 5,852 | + 3,230 |
| „ Total ... ... | „ 13 | 1,124 | 1,206 | + 82 | 20 | 22,152 | + 2,349 |
| Glasgow Corporation... | „ 16 | 42,537 | 42,024 | — 513 | 11 | 465,259 | + 1,211 |
| „ Motor Buses ... | „ 16 | 5,354 | 3,055 | — 2,299 | 11 | 87,352 | + 33,679 |
| „ Total ... ... | „ 16 | 47,891 | 45,079 | — 2,812 | 11 | 552,611 | + 34,890 |
| Gloucester Corp. ... | „ 13 | 596 | 706 | + 110 | 19½ | 13,800 | + 3,005 |
| Grimsby Corporation | „ 16 | 1,739 | 1,854 | + 115 | 20 | 31,610 | + 3,505 |
| Halifax Corporation | „ 12 | 4,574 | 5,039 | + 465 | 19½ | 99,949 | + 11,554 |
| Huddersfield Corp. ... | „ 16 | 6,039 | 6,036 | — 3 | 20 | 127,058 | — 1,511 |
| Hull Corporation ... | „ 16 | 5,838 | 5,639 | — 199 | 20 | 113,397 | — 2,053 |
| „ Motor Buses ... | „ 16 | 1,376 | 1,752 | + 376 | 20 | 30,628 | + 4,250 |
| „ Total ... ... | „ 16 | 7,214 | 7,391 | — 177 | 20 | 144,025 | + 2,197 |
| Ilford Corporation ... | „ 16 | 1,404 | 1,429 | + 25 | 19½ | 30,008 | + 559 |
| Ipswich Corp. Trol.Bus | „ 16 | 1,367 | 1,417 | + 50 | 19½ | 26,844 | + 1,537 |
| Isle of Thanet ... | „ 13 | 2,903 | 2,398 | — 505 | 32½ | 25,234 | — 2,280 |
| Kilmarnock Corp. ... | „ 16 | 450 | 440 | — 10 | 13½ | 6,502 | + 259 |
| Lancashire Un. ... | „ 10 | 2,196 | 2,068 | — 128 | 31½ | 67,771 | — 3,632 |
| „ Motor Buses ... | „ 10 | 5,206 | 5,655 | + 449 | 31½ | 155,434 | + 22,075 |
| Leeds Corporation ... | „ 16 | 19,530 | 19,106 | — 424 | 19½ | 396,053 | + 8,663 |
| Leicester Corp. ... | „ 16 | 7,914 | 7,703 | — 211 | 20 | 165,601 | + 942 |
| Lincoln Corp. ... | July 20 | 957 | 919 | — 38 | 16 | 14,840 | + 41 |
| Liverpool Corp. ... | Aug. 16 | 30,560 | 29,176 | — 1,384 | 19½ | 596,401 | — 31 |
| London County Coun. | „ 20 | 79,569 | 80,448 | + 879 | 20½ | 1,677,670 | — 10,580 |
| Luton Corporation ... | „ 13 | 406 | 383 | — 23 | 19½ | 8,332 | + 325 |
| Maidstone Corp. ... | „ 14 | 167 | Nil | — 167 | 19½ | Nil | — 4,650 |
| „ Motor Buses ... | „ 14 | 349 | 271 | — 78 | 19½ | 5,443 | + 157 |
| „ Trolley Buses ... | „ 14 | 305 | 593 | + 288 | 19½ | 12,109 | + 6,081 |
| „ Total ... ... | „ 14 | 821 | 864 | + 43 | 19½ | 17,552 | + 1,274 |
| Manchester Corp. ... | „ 9 | 33,452 | 30,104 | — 3,348 | 19 | 607,642 | — 52,970 |
| „ Motor Buses ... | „ 9 | 5,327 | 8,747 | + 3,420 | 19 | 162,936 | + 67,803 |
| „ Total ... ... | „ 9 | 38,779 | 38,851 | + 72 | 19 | 770,578 | + 14,833 |
| Middlesbrough Corp. | „ 12 | 1,125 | 968 | — 157 | 19½ | 20,096 | — 1,522 |
| „ Motor Buses ... | „ 12 | 516 | 538 | + 22 | 19½ | 11,031 | + 1,170 |
| „ Total ... ... | „ 12 | 1,641 | 1,506 | — 135 | 19½ | 31,127 | — 352 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty.Corp. | Aug. 16 | 10,136 | 8,200 | — 1,936 | 19½ | 173,468 | — 25,531 |
| „ Motor Buses ... | „ 16 | 2,129 | 3,341 | + 1,212 | 19½ | 60,981 | + 20,031 |
| „ Total ... ... | „ 16 | 12,265 | 11,541 | — 724 | 19½ | 234,449 | — 5,496 |
| Newport Corporation | „ 9 | 1,998 | 1,829 | — 169 | 19 | 30,435 | — 1,311 |
| „ Motor Buses ... | „ 9 | 1,007 | 1,035 | + 28 | 19 | 15,475 | + 1,109 |
| „ Total ... ... | „ 9 | 3,005 | 2,864 | — 141 | 19 | 45,910 | — 202 |
| Northampton Corp. ... | „ 8 | 1,025 | 1,047 | + 22 | 18½ | 20,430 | — 391 |
| „ Motor Buses ... | „ 8 | 785 | 790 | + 5 | 18½ | 13,590 | + 1,365 |
| „ Total ... ... | „ 8 | 1,810 | 1,837 | + 27 | 18½ | 34,020 | + 974 |
| Nottingham Corp ... | „ 14 | 6,578 | 5,385 | — 1,193 | 19½ | 113,027 | — 16,242 |
| „ Motor Buses ... | „ 14 | 544 | 1,114 | + 570 | 19½ | 23,414 | + 11,942 |
| „ Trolley Buses ... | „ 14 | 2,227 | 3,164 | + 937 | 19½ | 64,745 | + 20,730 |
| „ Total ... ... | „ 14 | 9,349 | 9,663 | + 314 | 19½ | 201,186 | + 16,430 |
| Oldham Corporation | „ 16 | 3,324 | 3,325 | + 1 | 21 | 70,111 | — 4,793 |
| „ Motor Buses ... | „ 16 | 2,013 | 1,928 | — 85 | 21 | 41,976 | — 1,092 |
| „ Total ... ... | „ 16 | 5,337 | 5,253 | — 84 | 21 | 112,087 | — 5,885 |
| Plymouth Corp ... | „ 16 | 4,192 | 3,873 | — 319 | 19½ | 73,588 | — 1,862 |
| „ Motor Buses ... | „ 16 | 2,065 | 2,566 | + 501 | 19½ | 48,644 | + 10,608 |
| „ Total ... ... | „ 16 | 6,257 | 6,439 | + 182 | 19½ | 122,232 | + 8,746 |
| Portsmouth Corp. ... | „ 16 | 6,628 | 5,653 | — 975 | 20 | 86,624 | — 6,550 |
| „ Motor Buses ... | „ 16 | 2,785 | 4,172 | + 1,387 | 20 | 66,719 | + 25,600 |
| „ Total ... ... | „ 16 | 9,413 | 9,825 | + 412 | 20 | 153,343 | + 19,050 |
| Preston Corporation... | „ 13 | 1,676 | 1,605 | — 71 | 19½ | 32,363 | — 1,574 |
| „ Motor Buses ... | „ 13 | 488 | 514 | + 26 | 19½ | 10,071 | + 650 |
| „ Total ... ... | „ 13 | 2,164 | 2,119 | — 45 | 19½ | 42,434 | — 924 |
| Rawtenstall Corp. ... | „ 17 | 837 | 645 | — 192 | 19½ | 12,953 | — 3,286 |
| „ Motor Buses ... | „ 17 | 480 | 724 | + 244 | 19½ | 13,918 | + 3,391 |
| „ Total ... ... | „ 17 | 1,317 | 1,369 | + 52 | 19½ | 26,871 | + 105 |
| Reading Corporation | „ 14 | 1,516 | 1,390 | — 126 | 20 | 28,157 | — 1,756 |
| „ Motor Buses ... | „ 14 | 927 | 936 | + 9 | 20 | 19,878 | + 1,913 |
| „ Total ... ... | „ 14 | 2,443 | 2,326 | — 117 | 20 | 48,035 | + 157 |
| Rochdale Corp. ... | „ 16 | 2,730 | 2,749 | + 19 | ... | 54,683 | — 5,248 |
| „ Motor Buses ... | „ 16 | 1,599 | 1,532 | — 67 | ... | 31,080 | + 173 |
| „ Total ... ... | „ 16 | 4,329 | 4,281 | — 48 | ... | 85,763 | — 5,075 |
| Rotherham Corp. ... | „ 18 | 2,593 | 2,597 | + 4 | 20 | 55,098 | + 1,945 |
| Salford Corporation ... | „ 17 | 10,734 | 10,592 | — 142 | 19½ | 222,846 | + 1,658 |
| Sheffield Corp. ... | „ 16 | 20,641 | 19,099 | — 1,542 | 19½ | 408,344 | — 10,389 |
| Southampton Corp. ... | „ 13 | 3,738 | 3,725 | — 13 | 20 | 68,010 | + 1,289 |
| „ Motor Buses ... | „ 13 | 846 | 860 | + 14 | 20 | 17,706 | + 2,339 |
| „ Total ... ... | „ 13 | 4,584 | 4,585 | + 1 | 20 | 85,116 | + 3,628 |
| Southend-on-Sea Corp. | „ 20 | 3,318 | 3,161 | — 157 | 20½ | 47,040 | — 2,598 |
| „ Trolley Buses ... | „ 20 | 406 | 478 | + 72 | 20½ | 6,738 | + 2,706 |
| „ Total ... ... | „ 20 | 3,724 | 3,639 | — 85 | 20½ | 53,778 | + 108 |
| Southport Corp. ... | „ 16 | 1,776 | 1,597 | — 179 | 19½ | 27,549 | — 384 |
| „ Motor Buses ... | „ 16 | 565 | 538 | — 27 | 19½ | 8,881 | + 879 |
| „ Total ... ... | „ 16 | 2,341 | 2,135 | — 206 | 19½ | 36,430 | + 495 |
| St. Helens Corp. ... | „ 15 | 2,074 | 2,093 | + 19 | 19½ | 39,347 | + 2,381 |
| Sunderland Corp. ... | „ 19 | 2,751 | 2,701 | — 50 | 20 | 51,866 | + 1,807 |
| „ Motor Buses ... | „ 19 | 356 | 621 | + 265 | 20 | 10,986 | + 6,918 |
| „ Total ... ... | „ 19 | 3,107 | 3,322 | + 215 | 20 | 62,852 | + 8,725 |
| Swindon Corp. .. | „ 13 | 994 | 1,087 | + 93 | 19½ | 19,107 | + 4,217 |
| Wallasey Corp. ... | „ 16 | 1,558 | 1,346 | — 212 | 19½ | 25,446 | — 2,284 |
| „ Motor Buses ... | „ 16 | 2,875 | 2,708 | — 167 | 19½ | 48,519 | + 4,067 |
| „ Total ... ... | „ 16 | 4,433 | 4,054 | — 379 | 19½ | 73,965 | + 1,803 |
| Walsall Corporation... | „ 10 | 4,022 | 3,691 | — 331 | 19 | 65,815 | + 198 |
| Walthamstow Corp. ... | „ 16 | 2,457 | 2,407 | — 50 | 19½ | 49,191 | — 57 |
| Warrington Corp. ... | „ 14 | 847 | 853 | + 6 | 20 | 17,598 | + 42 |
| „ Motor Buses ... | „ 14 | 432 | 482 | + 50 | 20 | 9,989 | + 1,184 |
| „ Total ... ... | „ 14 | 1,279 | 1,335 | + 56 | 20 | 27,587 | + 1,226 |
| West Ham Corp. ... | „ 14 | 5,954 | 5,635 | — 319 | 19½ | 118,252 | + 1,933 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | „ 10 | 3,558 | 3,139 | — 419 | 19 | 46,884 | — 7,033 |
| „ Trolley Buses ... | „ 10 | 3,639 | 3,573 | — 66 | 19 | 66,934 | + 3,728 |
| „ Total ... ... | „ 10 | 7,197 | 6,712 | — 485 | 19 | 113,818 | — 3,305 |
| York Corporation ... | „ 13 | 1,086 | 1,060 | — 26 | 20 | 20,411 | — 50 |
| „ Motor Buses ... | „ 13 | 415 | 542 | + 127 | 20 | 9,939 | + 2,582 |
| „ Trolley Buses ... | „ 13 | 46 | Nil | — 46 | 20 | Nil | — 999 |
| „ Total ... ... | „ 13 | 1,547 | 1,602 | + 55 | 20 | 30,350 | + 1,533 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Wks. or *M* | Aggregate. 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Aug. 19 | £81,598 | £75,140 | 33 w | £2,732,875 | — £116,103 |
| Brazilian Traction $ | July | 4,335,895 | 4,081,018 | 7 m | 28,367,377 | — 5,543 |
| British Columbia $ | June | 1,133,017 | 1,144,585 | 12 m | 14,658,732 | + 610,860 |
| Buenos Aires Lacroze | Aug. 17 | 11,546 | 10,913 | 7 w | 73,180 | — 6,491 |
| Burma E. Sup. Co. Rs. | June | 63,157 | 66,317 | 11 m | 709,845 | — 18,866 |
| Calcutta ... Rs. | Aug. 16 | 132,949 | 107,712 | 32½ w | 3,654,633 | — 508,520 |
| Cape Town ... ... | June | 27,995 | 25,525 | ... | ... | ... |
| Carthagena & Herrerias | July | 1,100 | 738 | 7 m | 6,350 | — 571 |
| Durban Corporation | June | 24,308 | 23,440 | 11 m | 261,923 | — 1,582 |
| East India ... ... | July | 3,801 | 3,833 | 12 m | 45,460 | + 470 |
| Kalgoorlie ... ... | May | 1,747 | 1,815 | 5 m | 8,134 | — 48 |
| Madras (2 weeks) Rs. | Aug. 15 | 46,482 | 48,656 | 32 w | 694,713 | + 35,626 |
| Para ... ... | July | 15,044 | 14,816 | 8 m | 118,623 | + 521 |
| Port Elizabeth ... | June | 7,335 | 6,951 | ... | ... | ... |
| Rangoon ... Rs. | July | 122,630 | 151,300 | 7 m | 1,050,935 | + 219,494 |
| Shanghai ... $ | June | 335,740 | 367,231 | 6 m | 1,923,202 | — 42,708 |
| Singapore ... ...$ | July | 131,000 | 145,000 | 10 m | 1,368,000 | + 154,000 |
| Winnipeg ... ...$ | June | 517,738 | 479,958 | 6 m | 3,273,504 | — 66,574 |

## RAILWAY RECEIPTS.

| 33rd Week ended Aug. 17th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 330,000 | — 18,000 | 317,000 | — 27,000 | 647,000 | — 45,000 | — 878,000 |
| L.M.S.R. | 667,000 | — 88,000 | 756,000 | — 87,000 | 1,423,000 | — 175,000 | —2,646,000 |
| L.N.E.R. | 458,000 | — 35,000 | 593,000 | — 105,000 | 1,051,000 | — 140,000 | —1,611,000 |
| S.R. | 427,000 | — 22,000 | 107,000 | — 6,000 | 534,000 | — 28,000 | — 283,000 |
| Totals | 1,882,000 | — 163,000 | 1,773,000 | — 225,000 | 3,655,000 | — 388,000 | —5,418,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Aug. 16 | 280,200 | 288,100 | + 7,900 | 9,940,200 | + 596,600 |
| Lond. & Sub. Group | „ 16 | 43,600 | 43,900 | + 300 | 1,455,200 | + 98,000 |
| Metropolitan Railway | „ 16 | 35,600 | 35,000 | — 600 | 1,212,300 | + 22,900 |
| Liverpool Overhead | „ 17 | 2,165 | 1,890 | — 275 | 51,893 | — 3,678 |
| Mersey Railway | „ 16 | 4,535 | 4,454 | — 81 | 150,351 | + 3,825 |

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THE
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THE ANNUAL SUBSCRIPTION INCLUDES 64 ISSUES, OF WHICH 12 ARE ILLUSTRATED NUMBERS.

LONDON, AUGUST 30, 1930.

## THE PRICE OF SPEED.

A London passenger has written to a daily paper stating that he travelled third class by railway from Charing Cross to Bromley North and paid 1s. 5d. for a single ticket, and that his return journey, involving three stages by omnibus, tramcar and underground, cost a total of only sixpence. Reasoning from this comparison of price alone, he asserts that our great railways are not likely to recover their lost supremacy unless they reduce their ordinary fares. What he forgets is the difference in the time occupied by a journey of this nature. He would have reason to grumble if the railway took as long over the journey as the combination of transport systems he mentions. People in the main travel by railway because it is speedier; by road because it is cheaper, and, in London particularly, more accessible; in the case of the long-distance coach because also of the comfort and absence of worry about accommodation and luggage. The greater the speed the higher the cost is an axiom of modern transport conditions, just as the telegram costs more than the letter. "Time is money" in the real sense to many people, and these are prepared to pay for speed. The highest-priced form of passenger transport is the aeroplane, yet to many of those who make use of it it is the cheapest, because it saves time. The private motor car is the speediest vehicle on the road, and its owner has to pay, both in capital cost and operating expenses, because of its speed and its exclusiveness. Express coaches plying as public service vehicles are speedier than omnibuses or tramcars, and their fares are higher in proportion. When it comes to omnibuses and tramcars, it will be found that the omnibus has the advantage on an unobstructed road, because tramways run along busy streets to cope with large numbers of people. The travelling public forget this when, as happens in many districts, omnibus fares are slightly more than those of the tramways, compared by fare stages. When, therefore, complaints are made of high fares on one method of transport compared with another, this factor of speed should be taken into consideration. Only harm can result when comparisons are made which show a lack of proportion, as that slower forms of transport should be as cheap as the faster. One might as well ask for the reintroduction of the horse tramways because they are cheaper.

## CORRESPONDENCE.

### THE GOVERNMENT AND UNEMPLOYMENT.

*To the Editor of* THE TRAMWAY AND RAILWAY WORLD.

SIR,—At the request of the Torquay Corporation, my company promoted a Bill last Session to authorise the substitution of the trolley vehicle system for the existing tramway. It was a Certified Bill—in other words, a Bill authorising works which would provide immediate employment.

The Bill came before a Select Committee of the House of Lords. It was opposed by the Devon County Council and the Paignton U.D.C. on points of detail only. It was also opposed by a recently formed association called the Torquay Citizens' League, on the grounds that the ratepayers' right of purchase of the tramway undertaking had been deferred without consulting the ratepayers.

Evidence was heard for and against, occupying three days, and the Bill was passed. It was opposed in the House of Commons, and in due course was passed by the Unopposed Committee. The Citizens' League managed to get the Bill objected to by Labour members and the Labour Party voting solidly against the Bill it was rejected. It was obvious that the members who spoke in support of the rejection had no knowledge of the facts. The first speaker stated that there was no provision made for facilities for workmen. That was untrue. The second speaker stated that the company would get larger fares than those at present allowed by the Tramway Act. That was also untrue. The Bill provided for reduced fares.

It was evident, however, in view of the case put up for the rejection, that there was some other motive, and I have before me a copy of a paper called "The Post," the organ of the Union of Post Office Workers, issued on July 19, in which the following article by Mr. George Middleton, M.P., the editor, appears:—

> "To go back to the beginning of the week. We had relief from the seemingly everlasting Finance Bill in the shape of the Torquay and Paignton Traffic Bill. The rejection of the Bill was moved by Mr. McKinlay, a Glasgow Labour member, and not only he, but many others, took a delight in creating difficulties for Torquay as a fitting punishment for the folly of the citizens in sending Commander Williams to represent the town—the member who now is known as "Talk-ee Williams." The Minister of Transport, Mr. Herbert Morrison, made it clear that the passing of the Bill was likely to be prejudiced by the part played in the House by Torquay's member. When the division was taken it was seen that the promoters of the Bill were heavily defeated. There was a good deal of satisfaction in certain quarters that the House had got even with the arch-obstructionist of the Opposition."

If the reason given by so high an authority as Mr. Middleton is correct, the Labour Party have upset the invariable Parliamentary practice, and have deliberately prevented immediate work to a large number of unemployed in Torquay in order to vent their vengeance on a member of Parliament with whose habits they do not happen to agree.—Yours faithfully,

W. B. COWNIE,
Managing Director,
Torquay Tramways Co., Ltd.

Salisbury Square House,
Salisbury Square, London, E.C.4.
August 28, 1930.

### CHANGE OF NAME OF TILLING-STEVENS MOTORS.

*To the Editor of* THE TRAMWAY AND RAILWAY WORLD.

SIR,—May I beg the use of a short space in your valued publication to inform your readers that the name of Tilling-Stevens Motors, Ltd., has been changed to T. S. Motors, Ltd.?

In order to forestall possible criticism, I would like to be permitted to state briefly the reasons for this somewhat unusual step.

(1) To remove the lingering impression that our products are confined to the manufacture of petrol-electric vehicles.

(2) To emphasise again that the operating company bearing an almost similar name has no financial or other interest in our company, and that such support as we receive has depended, and is dependent on, the merits of the "Express" gear-driven chassis.

(3) To assure Government, railway companies and municipal bodies that when purchasing our passenger-carrying vehicles they do not support in any way their competitors, since we have no financial or other interest in any operating company or group of operating companies, nor are we ever likely to adopt such a policy.

(4) To enable the representatives of competitors to refrain from supporting tacitly or otherwise any contrary statement which may be made.

For the information of your readers who are transacting business with us, may I say finally that beyond the change of name the affairs of the company will be conducted as heretofore.—Yours faithfully,

W. R. SHEPHARD,
Managing Director.
T. S. Motors, Ltd.
(formerly Tilling-Stevens Motors, Ltd.)

August 19, 1930.

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## MUNICIPAL TRAMWAYS AND TRANSPORT ASSOCIATION.

PROGRAMME OF ANNUAL CONFERENCE.

The annual conference of the Municipal Tramways and Transport Association, as previously announced, will be held at Harrogate on September 24, 25 and 26. The complete programme is as follows :—

TUESDAY, SEPTEMBER 23.

8.30 p.m. Informal reception at the Spa Rooms, Harrogate, by the Mayor of Harrogate (Alderman Richard Annakin) and the Mayoress (Mrs. Annakin) and the President of the Association (Alderman Thomas Canby, J.P.) and the President's daughter (Mrs. J. Hirst). Followed by a dance and entertainment.

WEDNESDAY, SEPTEMBER 24.

9.30 a.m. Meeting of the Council of the Association at the Hotel Majestic.

10.0 a.m. Civic Welcome at the Hotel Majestic by the Mayor of Harrogate.
PRESIDENTIAL ADDRESS by Alderman Thomas Canby, Chairman of the Huddersfield Corporation Tramways Committee.
Presentation of cheques and medals to prize-winners in the Essay Competition, 1930.
General Meeting of the Association.

1.0 p.m. Luncheon (members to make their own arrangements).

2.30 p.m. Paper by Councillor A. H. Gledhill, J.P., Chairman of the Halifax Corporation Tramways Committee on "The Transition of Transport between 1928 and 1930." Discussion to follow.

5.0 p.m. Adjournment.

7.30 p.m. Annual Dinner of the Association at the Hotel Majestic. Dance to follow.

THURSDAY, SEPTEMBER 25.

9.30 a.m. Meeting of the Council of the Association at the Hotel Majestic.

9.45 a.m. Meeting of the Managers' Section.
A report on the subject of Petrol Prices will be submitted.

10.15 a.m. Conference resumes. Discussion on Councillor Gledhill's paper.

12.45 p.m. Luncheon (members to make their own arrangements).

1.45 p.m. Official photograph in the grounds of the Hotel Majestic.

2.30 p.m. Paper by Mr. W. Vane Morland, General Manager of Tramways and Motors, Walsall, on "The Progress made with the Development of the Heavy Oil Engine." Discussion to follow.

FRIDAY, SEPTEMBER 26.

10.0 a.m. Motor coaches start from the Hotel Majestic for Huddersfield.

12.45 p.m. Luncheon at the Guildhall, Huddersfield, at the invitation of the Mayor (Alderman Walker T. Priest, J.P.) and the Chairman, Vice-Chairman and members of the Huddersfield Corporation Tramways Committee.

2.30 p.m. Motor coaches will leave Huddersfield for Temple Newsam, Leeds, where members will be the guests at tea of the Leeds City Tramways and Transport Committee.

7.30 p.m. Arrive in Harrogate.

A special programme for the ladies only has been prepared, containing full particulars of the arrangements made for visiting places of interest.

The headquarters will be the Hotel Majestic.

## TROLLEY OMNIBUS QUESTION IN BOMBAY.

Bombay Corporation has received a letter from the Government of Bombay asking the views of the Corporation on a letter from the general manager of the Bombay Electric Supply & Tramways Company regarding the construction and operation of trolleybuses which the company desire to use. The company stated that it would be necessary to make inquiries in England before suggesting a provision in the Bombay Tramways Act to provide for trolleybuses.

The Municipal Commissioner has advised that the following provisions should be incorporated in the Tramways Act: That vehicles should be fitted with pneumatic tyres; fares should be subject to the sanction of the Corporation; way-leave rental for the trolley vehicle overhead equipment, or alternatively, the rate should be fixed per vehicle according to seating capacity; power should be given to the Corporation to purchase the undertaking on certain conditions. The Commissioner added that some years ago the Bombay Electric Supply and Tramways Co. submitted to the Corporation a proposal to run an experimental trolleybus service. In the meantime the company had made an extensive trial with motor omnibuses in the city with success, but they wished to keep the application for the experimental trolleybus line in abeyance.

**Forty Years of Electrical Progress : the Story of the G.E.C.,** is the title of a new book by Mr. Adams Gowans White (160 pp. London : Ernest Benn, Ltd. Price 5s. net.) Much of the book is a biography of Sir Hugo Hirst, Bt. The story commences in 1886 when Mr. Hugo Hirst joined Mr. Gustav Byng and began the remarkable development of the undertaking which has received such notable success.

## MISCELLANEOUS NEWS AND NOTES.

**Merthyr Corporation** is considering the purchase of four motor omnibuses.

**Aberdeen Tramways Committee** are proceeding with the erection of a joiners' shop, a paint shop and an omnibus workshop at the King-street depot at a cost of £11,000.

**The Minister of Transport** and the London County Council have arranged for a road-widening scheme at Vauxhall Cross, south of Vauxhall Bridge, at a cost of £617,000.

**Central Omnibus Station for Belfast.**—It is understood that the L.M.S. Railway Co. has purchased premises adjoining Smithfield Market, in the centre of Belfast, for the purpose of building a covered omnibus station.

**Trailers Abandoned in Chicago.**—Trailer cars, which have been running on Madison-street, Chicago, since 1923, have recently been abandoned. Chicago street railways made the change in an effort to give better and faster services.

**A "Turning Left" Tramcar Sign.**—An illuminated sign at the corner of London-road and Saxby-street, Leicester, lights up automatically with the "turning left" notice when Melbourne-road tramcars are about to round the corner, thus giving notice to traffic following.

**Longer Fare Stages at Coventry.**—Beginning on September 1, the stages on the Coventry Corporation tramcar and omnibus routes will be lengthened by approximately one-third. The effect will be a reduction on the 1½d. and 2d. fares, reductions being already made on longer journeys.

**Manchester Cleansing Committee** has asked the city architect to prepare specifications and obtain tenders for the erection of a new garage at the Water-street depot, and for the extension of garage accommodation and provision of petrol pumps at Claremont-road depot, Rusholme.

**Tramways and Sheffield's New Park.**—For the opening on September 4 of the new park at Shiregreen, Sheffield, which has been presented to the city by Alderman J. G. Graves, the Lord Mayor and party will be conveyed by special tramcars in order to show the accessibility of the park from the city.

**A Wallasey Route to Close.**—Wallasey Tramways Committee has decided to close the Warren-drive tramway line as from October 1, instead of next April, as was previously arranged. The road is to be reconstructed. This is part of the Corporation plan to replace all its tramcars by omnibuses within five years.

**Juvenile Fares on Glasgow Tramcars.**—Glasgow Corporation Transport Committee has decided as an experiment that all children under fifteen shall be allowed to travel two stages on the tramcars for a halfpenny instead of one stage as at present. The concession will begin in September and will be reviewed in December.

**Broken Glass in 'Bus Accident.**—Eight persons were injured in a motor 'bus accident on the Glasgow-road near Port Glasgow on August 25, when one of the front tyres burst. The 'bus skidded and mounting a wall crashed into a tree. Many of the windows were shattered, some of the passengers receiving cuts from the broken glass.

**School Children's Fares at Halifax.**—School children between three and fourteen are now allowed to ride on the Halifax Corporation tramcars any distance for a penny. Beginning on September 1, cheap fares on the omnibuses will also come into operation, being £2 10s. per school year or 17s. 6d. per term, which works out at about 1s. per week.

**Eliminating Stopping Places.**—An illustration of what can be done in speeding up car services by eliminating unnecessary stops is afforded by the Broadway division of the St. Louis street railways, on which the service has been speeded up to an average of 12.35 m.p.h. This is now St. Louis' fastest line. On another route there is the high average of 12 m.p.h.

**Pupils' 4d. All-Day Tramway Tickets.**—The fourpenny all-day pupils' tickets, which the L.C.C. decided upon some time ago as an experiment, came into operation on Tuesday, when the L.C.C. schools reopened. They are available from 8 a.m. to 5 p.m. on Mondays to Fridays to full-time pupils up to 16 years of age, and between these hours entitle the holder to unlimited travel.

**New Uniforms for Edinburgh Tramwaymen.**—The tramwaymen of Edinburgh have been equipped with smart dark blue tunics and trousers and white-topped military pattern caps. Mr. F. A. Fitzpayne, manager of the Corporation Transport, says that a uniform is never allowed to become shabby before being replaced. Each one is tailored to measure, but made to a standard pattern.

**London Football Grounds by Tramway.**—The L.C.C. Tramways are distributing free copies of a football fixture card of English League matches in London, obtainable from tramway inspectors and regulators. It shows the services to the various grounds. The shilling ride-at-will ticket for the day will again be a popular feature of the football season. This includes all the grounds except Brentford, Crystal Palace, and Tottenham, for which there is a small extra fare. Within the area unlimited journeys may be made with this ticket.

**Glasgow Omnibus Difficulties.**—At a meeting of the Glasgow magistrates on August 26 the Town Clerk submitted a report on the recent Court of Sessions proceedings, and Mr. T. M. Wilson, an agent, made a statement on behalf of the omnibus companies—The Midland Services, The Scottish General Transport Co., and the Lanarkshire Transport Co. The magistrates agreed that the disputed questions should be remitted to the Chief Constable, who would confer with representatives of the companies with a view to reaching a settlement.

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**The Road Traffic Act and Road Motor Transport.**—A useful and informative pamphlet dealing with the important provisions of the Act affecting owners and drivers of commercial motor vehicles has been compiled by Mr. F. G. Bristow, general secretary of the Commercial Motor Users' Association, and may be obtained free on application to the Association at 50, Pall Mall, London, S.W.1.

**Omnibus Garages at Glasgow.**—The Glasgow Corporation garage at Eglington Toll is being considerably enlarged to provide more space which is required through the extension of omnibus transport. To avoid the necessity of pillars, roof spans of 140 ft. are being used. Although the extension will provide storage for 200 instead of 100 omnibuses, additional accommodation will be required and members of the Transport Committee have recently inspected suitable sites in the west end of the city.

**More Omnibuses for Rochdale.**—Rochdale Corporation Transport Committee has decided to substitute omnibuses for tramcars on four more routes, namely, Norden (beyond Churchill-street), Spotland (beyond Spotland Bridge), the Bamford section, and in the Littleborough district. The permission of the Town Council is to be asked to purchase six more Crossley six-cylinder omnibuses, three double-deck and three single-deck. Sanction for the borrowing of £22,000 for the purchase of fourteen omnibuses ordered last month has been received.

**Manchester Tramwaymen's Grievances.**—This (Saturday) evening the tramway employees of Manchester will meet to consider two questions that are causing dissatisfaction. One is the introduction of the "jumper" system in the work of the trolley boys. When a car leaves the congested area the boy has to join another car going to the city. Outward cars thus travel considerable distances without a trolley boy. Complaint is also made that at a certain time of the day a number of cars are taken off, and, as a consequence, greater speed is necessary for the cars running.

**The American Tramway Industry.**—Mr. R. S. Tompkins, of the Baltimore United Railways and Electric Co., commenting on the tramway industry in America, recently said that after having been in the dumps for many years the industry has started to modernise its plant and equipment. It is replacing heavy, slow vehicles with light, fast cars which are being made more comfortable. "Altogether," he adds, "signs are beginning to appear in many directions that the industry by some superhuman effort is lifting itself by its own boot straps and staging a healthy come-back."

**Perplexing Road Lights.**—The attention of the Automobile Association has been drawn to the confusion caused to visitors motoring in or through Leicester by the red lights indicating compulsory tramway stopping places, owing to the installation of automatic traffic signals in other cities and towns. Many motorists stopped at these red lights, mistaking their purpose. The matter was taken up with the chief constable, who has now informed the Association that the red lights are to be superseded by green ones with an orange band. It is anticipated that this alteration will be carried out before the winter arrives.

**London Public Vehicle Licensing.**—When Part IV of the Road Traffic Act comes into operation on November 1 it is expected that some relief of congestion of main traffic arteries in London will be effected. Hundreds of coaches and omnibuses from the provinces set down and pick up passengers in thoroughfares that are already congested. Under the new Act these vehicles will be licensed by the Traffic Commissioner, who will have power to impose conditions as to stopping places and routes. This is understood to be the reason why the L.G.O.C. are at present converting only part of the site which they have purchased for a coach station in Broad Street, Soho.

**Tramway Publicity at Manchester.**—Manchester Transport Department is making special efforts to induce more people to use the tramways. The publicity campaign includes the exhibition of attractive posters on the tramcars. Mr. R. Stuart Pilcher, general manager of the Manchester Transport, said to a local pressman that they were not, of course, trying to boost the tramcars in preference to the omnibuses. They wanted people to use both, but the number of tramway passengers had decreased. They had not before used posters as a form of publicity. Improvements were constantly being made to the tramcars, which should encourage more people to use them.

**Abandonment of Lanarkshire Tramways.**—The Lanarkshire Traction Co., the new name of the Lanarkshire Tramways Co., is to abandon most of its tramway system at the end of September. It served the thickly-populated industrial districts of Motherwell, Wishaw, Hamilton, Blantyre and Cambuslang, but the Motherwell-Bellshill-Uddingston circle and the Holytown-Bellshill track will continue a few months longer. On October 1 an omnibus service will come into operation between Newmains and Glasgow, covering the old tramway route. An agreement has been made with the local authorities whereby the company is relieved of their responsibility to restore the roadways on payment of £12,500 and handing over the track, equipment, setts and cables.

**The Future of Bexley Tramways.**—After the August vacation a conference of the Bexley and Dartford Urban Councils is to be held for the purpose of considering future policy in relation to the tramways owned by the two authorities. Mr. A. J. Abraham, general manager and electrical engineer, reports that when he took charge eight years ago the undertaking was in a shocking condition. For some years he has been keeping the tramways up with the help of second-hand rails, tramway standards and plant and material carefully chosen from scrapped tramways in other towns. Mr. Abraham adds that notwithstanding the difficulties the tramways have become an asset to the ratepayers, and have proved that a new and up-to-date system would be very valuable.

## FINANCIAL.

**Hurst, Nelson & Co., Ltd.,** rolling stock manufacturers, Motherwell, announce a final dividend of 2s. 6d. (12½ per cent.) and a bonus of 6d. (2½ per cent.) per share, both less tax, on the ordinary shares, making, with the interim dividend of 5 per cent. declared in March last, a total of 20 per cent. for the year, the same rate as was paid in the previous year.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended August 27 amounted to £80,600, a decrease of £1,019 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to August 27 (21 2-7 weeks), the total receipts were £1,758,685, a decrease of £11,636.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended August 9 give total receipts of £417,905, or £10,354 less than in the corresponding week of last year. The aggregate receipts for nineteen weeks amounted to £8,037,907, an increase of £118,301 over the corresponding period of last year.

**Aberdeen Corporation Tramways** results for the year ended May 31 last show that for the first time in the history of the department the revenue exceeded a quarter of a million. Mr. James L. Gunn, the manager, in his report, states that the combined revenue from the tramways and motor 'bus undertakings amounted to £258,308, an increase for the year of £19,944. This is attributed to a large extent to the influx of holiday-makers during the summer months. The revenue from the tramways was £167,637, an increase of £5,672, while working expenses amounted to £134,691, an increase of £3,148. The gross profit was £32,945, and the net profit £7,483.

**Ilford Corporation Tramways.**—Mr. L. E. Harvey, general manager of the Ilford Corporation Tramways, is again to be congratulated on the result of another year's working. For the year ended March 31, 1930, there was a gross surplus of £24,234, which is £2,660 greater than the gross surplus for any previous year in the history of the undertaking. The net surplus is £8,840, greater by £166 than any previous net surplus. The total revenue was £79,169, and the total expenses £58,010. Ilford Corporation Tramways, although one of the smallest, is one of the most successful in the country. Throughout the period when other Metropolitan tramway undertakings were recording losses, Ilford tramways consistently showed a profit, and it is not surprising that the Town Council are highly gratified with the excellent results of the past year. Alderman G. R. Davy, chairman of the Tramways Committee, at the meeting of the Council on August 19, alluded to the fact that the net profits were the highest ever obtained. The Mayor, F. D. Smith, also remarked on the excellent results, and a number of members congratulated the general manager.

## PERSONAL.

**Mr. George Cox,** superintendent of the Abbey Wood district of the London County Council Tramways, has retired at the age of 73, after 53 years' service.

**Mr. J. J. Marshall** has been appointed general manager of Falkirk and District Traction Co. He was formerly with the Scottish General Omnibus Co. and Dunfermline Traction Co.

**Mr. F. Nicholls,** deputy borough electrical engineer of Derby, has been appointed borough electrical engineer, at a salary of £1,100 a year. Mr. Nicholls succeeds Mr. G. H. Lake, who is going to Nottingham.

**Mr. E. J. Doran,** tramway traffic manager at Sydney, has been asked by the New South Wales Government to assist in the reorganisation of road transport under the new Transport Trust, which will have control of all the State transport services, except railways. This is a recognition of Mr. Doran's outstanding work for the tramways. He will retire at the end of the year, when he reaches the age of 65, on a pension of £800 a year.

**Mr. J. Jeffrey,** an omnibus driver with the Glasgow Transport Department, has been awarded the first prize of £10 and a silver medal in the competition of the Municipal Tramways and Transport Association for an essay on the organisation of omnibus garages for fifty or a hundred vehicles. He is to be given leave of absence to attend the conference of the Association at Harrogate, in September, to receive his prize. **Mr. A. C. Stewart,** a sub-station attendant, has also been awarded £10 and a silver medal for an essay on welfare work.

## BUSINESS NOTES.

**Shepherd's Parging Block Co., Ltd.,** notify a change in the telephone number of their London office and works from Chiswick 2021 to Shepherd's Bush 2361.

**The London Oil Refining Co.,** manufacturers of Lorco motor oils, have notified us that their London office has been removed to Lorco Works, Welwyn Garden City, Herts. (Telephone No.: Welwyn Garden 695; telegraphic address: "Lorco," Welwyn Garden City.)

**The Leamington and Warwick Tramways Co.** discontinued their tramway services on August 18 and replaced the cars with omnibuses, powers for which were obtained under the terms of the Leamington and Warwick Traction Act, 1929. The tramway tracks are in process of removal. The rails, which weigh 90 lbs. to the yard, are to be sold as scrap. The original horse car service was inaugurated in 1882 and was continued until July, 1905, when they were replaced by electric cars.

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## CONTRACTS.

**Aberdeen Tramways Committee** has recommended the purchase of 14 Crossley double-deck omnibuses at a cost of £23,240.

**Ransomes, Sims & Jefferies, Ltd.,** Ipswich, have received an order from St. Helens Corporation for five six-wheel double-deck trolley-buses complete.

**Glasgow Corporation** has placed contracts for reconstruction of rotary converters with Bruce Peebles & Co., British Thomson-Houston Co., General Electric Co., Metropolitan-Vickers Electrical Co., and the English Electric Co.

As mentioned in a recent issue, the **Vulcan Motor & Engineering Co., Ltd.,** have received an order from Glasgow Corporation for 25 "Emperor" 50-seat double-deck chassis. The chassis includes the Vulcan "Monarch" engine. Among other corporations that have ordered the "Emperor" chassis are Liverpool, Southampton and Southport.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | Aug. 19 | 517 | 512 | — 5 | 20 | 11,600 | — 222 |
| „ Motor Buses ... | „ 19 | 210 | 277 | + 67 | 20 | 5,870 | + 994 |
| „ Total ... ... | „ 19 | 727 | 789 | + 62 | 20 | 17,470 | + 772 |
| Aberdeen Corp. ... | „ 20 | 5,704 | 6,175 | + 471 | 11½ | 67,824 | + 658 |
| Ashton-u-Lyne Corp. | „ 16 | 979 | 912 | — 67 | 20 | 17,160 | — 1,308 |
| „ Motor Buses ... | „ 16 | 518 | 527 | + 9 | 20 | 10,053 | + 1 |
| „ Trolley Buses ... | „ 16 | 273 | 297 | + 24 | 20 | 5,257 | — 343 |
| „ Total ... ... | „ 16 | 1,770 | 1,736 | — 34 | 20 | 32,470 | — 1,650 |
| Ayr Corporation ... | „ 23 | 717 | 654 | — 63 | 14 | 10,009 | — 692 |
| Barrow Corporation... | „ 23 | 642 | 583 | — 59 | 21 | 12,408 | — 1,057 |
| „ Motor Buses ... | „ 23 | 503 | 444 | — 59 | 21 | 8,900 | + 754 |
| „ Total ... ... | „ 23 | 1,145 | 1,027 | — 118 | 21 | 21,308 | + 303 |
| Belfast City ... ... | „ 22 | 12,001 | 11,641 | — 360 | 20⅞ | 235,646 | + 6,689 |
| „ Motor Buses ... | „ 22 | 920 | 1,209 | + 289 | 20⅞ | 26,892 | + 5,734 |
| „ Total ... ... | „ 22 | 12,921 | 12,850 | — 71 | 20⅞ | 262,538 | + 12,423 |
| Birkenhead Corp. ... | „ 24 | 1,733 | 1,479 | — 254 | 21 | 32,824 | — 3,327 |
| „ Motor Buses ... | „ 24 | 3,629 | 4,181 | + 552 | 21 | 78,399 | — 3,103 |
| „ Total ... ... | „ 24 | 5,362 | 5,660 | + 298 | 21 | 111,223 | — 6,430 |
| Birmingham Corp. ... | „ 19 | 25,781 | 24,530 | — 1,251 | 20 | 527,916 | — 13,870 |
| „ Motor Buses ... | „ 19 | 12,399 | 14,878 | + 2,479 | 20 | 306,181 | + 50,167 |
| „ Trolley Buses ... | „ 19 | 521 | 496 | — 25 | 20 | 10,964 | — 14 |
| „ Total ... ... | „ 19 | 38,701 | 39,904 | + 1,203 | 20 | 845 061 | + 36,283 |
| Blackburn Corp. ... | „ 13 | 1,963 | 1,734 | — 229 | 19⅞ | 35,620 | — 3,110 |
| „ Motor Buses ... | „ 13 | Nil | 311 | + 311 | 19¼ | 6,252 | + 6,252 |
| „ Total ... ... | „ 13 | 1,963 | 2,045 | + 82 | 19¼ | 41,872 | + 3,142 |
| Bradford Corporation | „ 23 | 14,464 | 14,022 | — 442 | 21 | 297,490 | — 12,884 |
| Brighton Corporation | „ 24 | 3,424 | 3,391 | — 33 | 20⅞ | 60,816 | + 1,970 |
| Burnley Corporation... | „ 23 | 2,823 | 2,663 | — 160 | ... | ... | ... |
| „ Motor Buses ... | „ 23 | 610 | 677 | + 67 | ... | ... | ... |
| „ Total ... ... | „ 23 | 3,433 | 3,340 | — 93 | ... | ... | ... |
| Burton-on-Trent Corp. | „ 24 | 802 | 831 | + 29 | 21 | 17,760 | + 598 |
| Bury Corporation ... | „ 24 | 2,005 | 1,785 | — 220 | 20⅞ | 38,064 | — 4,790 |
| „ Motor Buses ... | „ 24 | 542 | 1,122 | + 580 | 20⅞ | 23,093 | + 14,142 |
| „ Total ... ... | „ 24 | 2,547 | 2,907 | + 360 | 20⅞ | 61,157 | + 9,352 |
| Cardiff Corporation ... | „ 2 | 7,502 | 7,891 | + 389 | 17⅞ | 138,887 | + 2,978 |
| Chatham and District | „ 21 | 1,404 | 1,288 | — 116 | 33 | 38,239 | + 737 |
| Chester Corporation ... | „ 24 | 459 | Nil | — 459 | 21 | Nil | — 9,434 |
| „ Motor Buses ... | „ 24 | Nil | 693 | + 693 | 21 | 14,003 | + 14,003 |
| „ Total ... ... | „ 24 | 459 | 693 | + 234 | 21 | 14,003 | + 4,569 |
| Chesterfield Corp. ... | „ 25 | 1,903 | 1,947 | + 44 | 21 | 40,039 | + 1,168 |
| Colchester Corp. ... | „ 27 | 585 | 652 | + 67 | 22 | 13,527 | + 1,504 |
| Colne Corporation ... | „ 20 | 726 | 691 | — 35 | 20 | 14,489 | — 127 |
| Coventry Corporation | „ 24 | 2,050 | 1,879 | — 171 | 21 | 42,075 | — 2,715 |
| „ Motor Buses ... | „ 24 | 1,564 | 1,749 | + 185 | 21 | 37,985 | + 5,063 |
| „ Total ... ... | „ 24 | 3,614 | 3,628 | + 14 | 21 | 80,060 | + 2,348 |
| Darlington Corp. ... | „ 23 | 978 | 1,030 | + 52 | 20⅞ | 22,135 | + 1,973 |
| Derby Corporation ... | „ 23 | 2,426 | 2,351 | — 75 | 21 | 51,356 | — 1,152 |
| „ Motor Buses ... | „ 23 | 760 | 885 | + 125 | 21 | 19,115 | + 4,341 |
| „ Total ... ... | „ 23 | 3.186 | 3,236 | + 50 | 21 | 70,471 | + 3,189 |
| Dover Corporation ... | „ 23 | 585 | 616 | + 31 | 21 | 9,220 | + 271 |
| Dundee Corporation... | „ 12 | 2,656 | 2,536 | — 120 | 12⅞ | 32,504 | — 1,122 |
| „ Motor Buses ... | „ 12 | 819 | 1,161 | + 342 | 12⅞ | 13.796 | + 3,250 |
| „ Total ... ... | „ 12 | 3,475 | 3,697 | + 222 | 12⅞ | 46,300 | + 2,128 |
| East Ham Corp. ... | „ 23 | 2,383 | 2,357 | — 26 | 20⅞ | 47,746 | + 708 |
| Edinburgh Corp. ... | „ 16 | 13,801 | 14,098 | + 297 | 13⅞ | 207,091 | + 4,851 |
| „ Motor Buses ... | „ 16 | 3,377 | 3,606 | + 229 | 13⅞ | 52,192 | + 4,245 |
| „ Total ... ... | „ 16 | 17,178 | 17,704 | + 526 | 13⅞ | 259,283 | + 9,096 |
| Exeter Corporation ... | „ 27 | 940 | 805 | — 135 | 22 | 17,893 | — 1,147 |
| „ Motor Buses .... | „ 27 | 176 | 415 | + 239 | 22 | 6,675 | + 3,700 |
| „ Total .. .... | „ 27 | 1,116 | 1,220 | + 104 | 22 | 24,568 | + 2,553 |
| Glasgow Corporation... | „ 16 | 42,537 | 42,024 | — 513 | 11 | 465,259 | + 1,211 |
| „ Motor Buses ... | „ 16 | 5,354 | 3,055 | — 2,299 | 11 | 87,352 | + 33,679 |
| „ Total ... ... | „ 16 | 47,891 | 45,079 | — 2,812 | 11 | 552,611 | + 34,890 |
| Gloucester Corp. ... | „ 20 | 560 | 705 | + 145 | 20⅞ | 14,505 | + 3,149 |
| Grimsby Corporation | „ 23 | 1,656 | 1,758 | + 102 | 21 | 33,368 | + 3,619 |
| Halifax Corporation | „ 19 | 5,039 | 4,855 | + 184 | 20½ | 104,804 | + 11,370 |
| Huddersfield Corp. ... | „ 23 | 6,278 | 6,381 | + 103 | 21 | 133,440 | — 1,408 |
| Hull Corporation ... | „ 23 | 5,755 | 5,517 | — 238 | 21 | 118,914 | — 2,291 |
| „ Motor Buses ... | „ 23 | 1,359 | 1,708 | + 349 | 21 | 32,337 | + 4,600 |
| „ Total ... ... | „ 23 | 7,114 | 7,225 | + 111 | 21 | 151,251 | + 2,309 |
| Ilford Corporation ... | „ 23 | 1,426 | 1,480 | + 54 | 20⅞ | 31,488 | + 621 |
| Ipswich Corp. Trol.Bus | „ 23 | 1,351 | 1,417 | + 66 | 20⅞ | 28,261 | + 1,612 |
| Isle of Thanet ... | „ 20 | 2,654 | 2,164 | — 490 | 33½ | 27,390 | — 2,770 |
| Kilmarnock Corp. ... | „ 23 | 478 | 498 | + 20 | 14⅞ | 7,000 | + 279 |
| Lancashire Un. ... | „ 17 | 2.132 | 2,124 | — 8 | 32⅞ | 69,895 | — 3,648 |
| „ Motor Buses ... | „ 17 | 4,863 | 5,740 | + 877 | 32⅞ | 161,172 | + 22,907 |
| Leeds Corporation ... | „ 23 | 19,122 | 19,431 | + 309 | 20⅞ | 415,484 | + 9,013 |
| Leicester Corp. ... | „ 23 | 8.185 | 8,039 | — 146 | 21 | 173,641 | + 875 |
| Lincoln Corp. ... | „ 24 | 969 | 961 | — 8 | 21 | 19,724 | + 70 |
| Liverpool Corp. ... | „ 23 | 29, 300 | 29,608 | + 308 | 20⅞ | 626,010 | — 276 |
| London County Coun. | „ 27 | 81,619 | 80,600 | — 1,019 | 21¼ | 1,758,685 | — 11,636 |
| Luton Corporation ... | „ 20 | 408 | 401 | — 7 | 20⅞ | 8,733 | + 318 |
| Maidstone Corp. ... | „ 21 | 157 | Nil | — 157 | 20⅞ | Nil | — 4,807 |
| „ Motor Buses ... | „ 21 | 343 | 276 | — 67 | 20⅞ | 5,719 | + 224 |
| „ Trolley Buses ... | „ 21 | 298 | 581 | + 283 | 20⅞ | 12,690 | + 6,364 |
| „ Total ... ... | „ 21 | 798 | 857 | + 59 | 20⅞ | 18,409 | + 1,333 |
| Manchester Corp. ... | „ 16 | 33,585 | 30,336 | — 3,249 | 20 | 637,978 | — 56,219 |
| „ Motor Buses ... | „ 16 | 4,996 | 8,222 | + 3,226 | 20 | 171,159 | + 71,030 |
| „ Total ... ... | „ 16 | 38,581 | 38,558 | — 23 | 20 | 809,137 | + 14,811 |
| Middlesbrough Corp. | „ 12 | 1,125 | 968 | — 157 | 19¼ | 20,096 | — 1,522 |
| „ Motor Buses ... | „ 12 | 516 | 538 | + 22 | 19¼ | 11,031 | + 1,170 |
| „ Total ... ... | „ 12 | 1,641 | 1,506 | — 135 | 19¼ | 31,127 | — 352 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks. | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty.Corp. | Aug. 23 | 10,209 | 8,397 | — 1,812 | 20⅞ | 181,865 | — 27,343 |
| „ Motor Buses ... | „ 23 | 2,061 | 3,304 | + 1,243 | 20⅞ | 64,285 | + 21,278 |
| „ Total ... ... | „ 23 | 12,270 | 11,701 | — 569 | 20⅞ | 246,150 | — 6,065 |
| Newport Corporation | „ 16 | 1,598 | 1,488 | — 110 | 20 | 31,923 | — 1,421 |
| „ Motor Buses ... | „ 16 | 740 | 750 | + 10 | 20 | 16,225 | + 1,119 |
| „ Total ... ... | „ 16 | 2,338 | 2,238 | — 100 | 20 | 48,148 | — 302 |
| Northampton Corp. ... | „ 22 | 1,077 | 1,057 | — 20 | 20⅞ | 22,551 | — 441 |
| „ Motor Buses ... | „ 22 | 701 | 690 | — 11 | 20⅞ | 15,018 | + 1,428 |
| „ Total ... ... | „ 22 | 1,778 | 1,747 | — 31 | 20⅞ | 37,569 | + 987 |
| Nottingham Corp. ... | „ 21 | 6,590 | 5,349 | — 1,241 | 20⅞ | 118,376 | — 17,485 |
| „ Motor Buses ... | „ 21 | 569 | 1,165 | + 596 | 20⅞ | 24,579 | + 12,540 |
| „ Trolley Buses ... | „ 21 | 2,280 | 3,315 | + 1,035 | 20⅞ | 68,061 | + 21,766 |
| „ Total ... ... | „ 21 | 9,439 | 9,829 | + 390 | 20⅞ | 211,016 | + 16,821 |
| Oldham Corporation | „ 23 | 3,433 | 3,348 | — 85 | 22 | 73,460 | — 4,878 |
| „ Motor Buses ... | „ 23 | 2,023 | 1,984 | — 39 | 22 | 43,960 | — 1,132 |
| „ Total ... ... | „ 23 | 5,456 | 5,332 | — 124 | 22 | 117,420 | — 6,010 |
| Plymouth Corp. ... | „ 23 | 5,069 | 3,647 | — 1,422 | 20⅞ | 77,235 | — 3,285 |
| „ Motor Buses ... | „ 23 | 2,325 | 2,569 | + 244 | 20⅞ | 51,214 | + 10,853 |
| „ Total ... ... | „ 23 | 7,394 | 6,216 | — 1,178 | 20⅞ | 128,449 | + 7,548 |
| Portsmouth Corp. ... | „ 23 | 6,966 | 5,618 | — 1,348 | 21 | 92,270 | — 7,870 |
| „ Motor Buses ... | „ 23 | 2,760 | 4,168 | + 1,408 | 21 | 72,283 | + 28,404 |
| „ Total ... ... | „ 23 | 9,726 | 9,786 | + 60 | 21 | 164,553 | + 20,534 |
| Preston Corporation... | „ 20 | 1,673 | 1,574 | — 99 | 20⅞ | 33,938 | — 1,672 |
| „ Motor Buses ... | „ 20 | 486 | 490 | + 4 | 20⅞ | 10,561 | + 654 |
| „ Total ... ... | „ 20 | 2,159 | 2,064 | — 95 | 20⅞ | 44,499 | — 1,018 |
| Rawtenstall Corp. ... | „ 24 | 889 | 658 | — 231 | 20⅞ | 13,611 | — 4,058 |
| „ Motor Buses ... | „ 24 | 491 | 742 | + 251 | 20⅞ | 14,660 | + 3,642 |
| „ Total ... ... | „ 24 | 1,380 | 1,400 | + 20 | 20⅞ | 28,271 | — 416 |
| Reading Corporation | „ 21 | 1,492 | 1,428 | — 64 | 21 | 29,586 | — 1,328 |
| „ Motor Buses ... | „ 21 | 901 | 970 | + 69 | 21 | 20,841 | + 1,974 |
| „ Total ... ... | „ 21 | 2,393 | 2,398 | + 5 | 21 | 50,427 | + 646 |
| Rochdale Corp. ... | „ 23 | 2,084 | 2,781 | + 697 | ... | 57,464 | — 4,552 |
| „ Motor Buses ... | „ 23 | 1,436 | 1 540 | + 104 | ... | 32,620 | + 277 |
| „ Total ... ... | „ 23 | 3,520 | 4,321 | + 799 | ... | 90,084 | — 4,275 |
| Rotherham Corp. ... | „ 25 | 2,671 | 2,754 | + 83 | 21 | 57,852 | + 2,028 |
| Salford Corporation ... | „ 24 | 11,061 | 10,718 | — 343 | 20⅞ | 233,590 | + 1,523 |
| Sheffield Corp. ... | „ 23 | 20,262 | 19,451 | — 811 | 20⅞ | 427,795 | — 11,200 |
| Southampton Corp. ... | „ 20 | 3,605 | 3,760 | + 155 | 21 | 71,771 | + 1,622 |
| „ Motor Buses ... | „ 20 | 824 | 875 | + 51 | 21 | 17,984 | + 2,392 |
| „ Total ... ... | „ 20 | 4,429 | 4,635 | + 206 | 21 | 89,752 | + 4,014 |
| Southend-on-Sea Corp. | „ 20 | 3,318 | 3,161 | — 157 | 20⅞ | 47,040 | — 2,598 |
| „ Trolley Buses ... | „ 20 | 406 | 478 | + 72 | 20⅞ | 6,738 | + 2,706 |
| „ Total ... ... | „ 20 | 3,724 | 3,639 | — 85 | 20⅞ | 53,778 | + 108 |
| Southport Corp. ... | „ 23 | 1,631 | 1,492 | — 139 | 20⅞ | 29,041 | — 523 |
| „ Motor Buses ... | „ 23 | 493 | 503 | + 10 | 20⅞ | 9,384 | + 889 |
| „ Total ... ... | „ 23 | 2,124 | 1,995 | — 129 | 20⅞ | 39,425 | + 366 |
| St. Helens Corp. ... | „ 19 | 1,968 | 2,039 | + 71 | 20⅞ | 41,315 | + 2,452 |
| Sunderland Corp. ... | „ 26 | 2,654 | 2,691 | + 37 | 21 | 54,557 | + 1,844 |
| „ Motor Buses ... | „ 26 | 307 | 704 | + 397 | 21 | 11,690 | + 7,314 |
| „ Total ... ... | „ 26 | 2,961 | 3,395 | + 434 | 21 | 66,247 | + 9,158 |
| Swindon Corp. ... | „ 20 | 893 | 1,063 | + 170 | 20⅞ | 20,169 | + 4,386 |
| Wallasey Corp. ... | „ 23 | 1,425 | 1,300 | — 125 | 20⅞ | 26,746 | — 2,389 |
| „ Motor Buses ... | „ 23 | 2,329 | 2,693 | + 364 | 20⅞ | 51,212 | + 4,431 |
| „ Total ... ... | „ 23 | 3,754 | 3,993 | + 239 | 20⅞ | 77,958 | + 2,042 |
| Walsall Corporation... | „ 17 | 3,315 | 3,342 | + 27 | 20 | 69,157 | + 1,225 |
| Walthamstow Corp. ... | „ 23 | 2,462 | 2,496 | + 33 | 20⅞ | 51,687 | — 24 |
| Warrington Corp. ... | „ 21 | 850 | 856 | + 6 | 21 | 18,454 | + 48 |
| „ Motor Buses ... | „ 21 | 436 | 478 | + 42 | 21 | 10,467 | + 1,226 |
| „ Total ... ... | „ 21 | 1,286 | 1,334 | + 48 | 21 | 28,921 | + 1,274 |
| West Ham Corp. ... | „ 21 | 6,052 | 5,918 | — 134 | 20⅞ | 124,170 | + 1,799 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | „ 17 | 2,690 | 2,386 | — 304 | 20 | 49,270 | — 7,338 |
| „ Trolley Buses ... | „ 17 | 3,204 | 3,239 | + 35 | 20 | 70,174 | + 3,763 |
| „ Total ... ... | „ 17 | 5,894 | 5,625 | — 269 | 20 | 119,444 | — 3,575 |
| York Corporation ... | „ 20 | 1,087 | 1,084 | — 3 | 21 | 21,494 | — 54 |
| „ Motor Buses ... | „ 20 | 433 | 51 0 | + 77 | 21 | 10,449 | + 2,659 |
| „ Trolley Buses ... | „ 20 | 62 | Nil | — 62 | 21 | Nil | — 1,060 |
| „ Total ... ... | „ 20 | 1,582 | 1,594 | + 12 | 21 | 31,943 | + 1,545 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or *M* | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Aug. 26 | £84,453 | £76,654 | 34 w | £2,809,529 | — £123,902 |
| Brazilian Traction $ | July | 4,335,895 | 4,081,018 | 7 m | 28,367,377 | — 5,543 |
| British Columbia $ | June | 1,133,017 | 1,144,585 | 12 m | 14,658,732 | + 610,860 |
| Buenos Aires Lacroze | Aug. 24 | 11,750 | 10,651 | 8 w | 83,831 | — 7,590 |
| Burma E. Sup. Co. Rs. | July | 64,649 | 66,444 | 12 m | 776,289 | — 17,071 |
| Calcutta ... Rs. | Aug. 23 | 124,717 | 107,938 | 33⅞ w | 3,762,571 | — 525,299 |
| Cape Town ... ... | July | 27,779 | 24,953 | ... | ... | ... |
| Carthagena & Herrerias | July | 1,100 | 738 | 7 m | 6,350 | — 571 |
| Durban Corporation | June | 21,308 | 23,440 | 11 m | 261,923 | — 1,582 |
| East India ... ... | July | 3,801 | 3,833 | 12 m | 45,460 | + 470 |
| Kalgoorlie ... ... | May | 1,747 | 1,815 | 5 m | 8,134 | — 68 |
| Madras (2 weeks) Rs. | Aug. 15 | 46,482 | 48,656 | 32 w | 694,713 | + 35,626 |
| Para ... ... | July | 15,044 | 14,816 | 8 m | 118,623 | + 521 |
| Port Elizabeth ... | July | 7,503 | 7,045 | ... | ... | ... |
| Rangoon ... Rs. | July | 122,630 | 151,300 | 7 m | 1,050,935 | + 219,494 |
| Shanghai ... $ | June | 335,740 | 367,231 | 6 m | 1,923,202 | — 42,708 |
| Singapore ... ...$ | July | 131,000 | 145,000 | 10 m | 1,368,000 | + 154,000 |
| Winnipeg ... ...$ | June | 517,738 | 479,958 | 6 m | 3,273,504 | — 66,574 |

## RAILWAY RECEIPTS.

| 34th Week ended Aug. 24th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 309,000 | — 3,000 | 332,000 | — 24,000 | 641,000 | — 27,000 | — 905,000 |
| L.M.S.R. | 587,000 | — 58,000 | 780,000 | — 91,000 | 1,367,000 | — 149,000 | -2,795,000 |
| L.N.E.R. | 426,000 | — 36,000 | 608,000 | — 99,000 | 1,034,000 | — 135,000 | -1,746,000 |
| S.R. | 399,000 | — 20,000 | 111,000 | — 11,000 | 510,000 | — 31,000 | — 314,000 |
| Totals | 1,721,000 | — 117,000 | 1,831,000 | — 225,000 | 3,552,000 | — 342,000 | -5,760,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Aug. 23 | 278,400 | 290,900 | + 12,500 | 10,231,100 | + 609,100 |
| Lond. & Sub. Group | „ 23 | 42,600 | 44,300 | + 1,700 | 1,499,500 | + 99,700 |
| Metropolitan Railway | „ 23 | 35,600 | 35,100 | — 500 | 1,247,400 | + 22,400 |
| Liverpool Overhead | „ 24 | 1,973 | 1,739 | — 234 | 53,632 | — 3,912 |
| Mersey Railway ... | „ 23 | 4,281 | 4,353 | + 72 | 154,704 | + 3,897 |

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LONDON, SEPTEMBER 6, 1930.

## BATTERY DRIVEN RAIL VEHICLES.

Railway and tramway operators are awaiting with much interest the results of tests that are being made with the electric storage battery invented by Dr. Drumm, of Dublin. A company, in which the Irish Free State Government holds a controlling interest, is now carrying out experimental railway work with this battery. The Government's participation in the enterprise has been brought about in the hope of finding in cheap railway electrification a market for power from the Shannon. A report recently issued by the Minister for Industry and Commerce states that the endurance tests have not yet been completed, but there are indications that the battery will have a long life. The railway tests are also incomplete, as the total number of cells required has not yet been produced. The battery is a low resistance alkaline battery, and it is claimed to be so constructed that it cannot be damaged by vibration. It is of much higher voltage than earlier alkaline accumulators, is said to be superior in respect to retention of charge, and, on account of its low resistance, can be charged and discharged at much higher rates. Energy efficiency is given as 75 per cent. under practical operating conditions, current efficiency being 95 per cent. It is described as yielding large currents without appreciable voltage drop, thus enabling it to give acceleration rates and maximum speeds sufficient for railway service. Acceleration rates of one m.p.h. per second have been maintained. The coach being used for the tests is equipped with two 30 h.p. motors, capable of 100 per cent. overload for ten minutes, and 200 per cent. overload for a short period. These motors are designed for 110 volts, and when the full number of cells has been installed, it is estimated that maximum speeds of over 50 m.p.h. can be maintained. Another characteristic which should render this battery suitable for traction work is its freedom from fumes and gassing. Experiments with accumulator rail-cars are, of course, by no means a novelty. They have been made in many countries, and some interesting particulars will be found in the abstract of a paper submitted to the recent Congress of the International Tramways Union at Warsaw by M. P. L. Balbo, and published in the issue of this journal of August 14. Operation, it appears, has been moderately successful in Germany and Italy, but, as the author of the paper says, with truth, present accumulators are still far from ideal, although great strides have been made by the Edison and Tudor types. In this country several attempts that have been made to operate battery rail-cars and omnibuses have been abandoned. A notable experiment was made at Birmingham as long ago as 1893, and it was continued for several years. This venture was fully described in the issue of THE TRAMWAY AND RAILWAY WORLD for May, 1893. For a considerable period the working of the tramway was successful, but the cost of operation gradually increased, and by April, 1896, the battery system was being worked at a loss at the rate of 4.75d. a car mile. A successful battery would provide an admirable system for the operation of tramcars, and it may be hoped that further experiments in Ireland will realise the hopes engendered by the results so far obtained. In view, however, of past experience, it would be premature to anticipate that difficulties hitherto encountered have been overcome.

## INTERNATIONAL TRAMWAYS UNION.

PROPOSED MEETING IN PARIS.

The President of the International Union of Tramways, Light Railways and Public Automobile Transport, has issued a notice to members on behalf of the Council, with reference to a meeting to be held in Paris towards the end of October. M. André Mariage, vice-president of the International Tramways and Light Railways Union, president and managing-director of the Paris Public Transport Co., after the discussion of the subject of regenerative compound motors at the Congress at Warsaw, offered to arrange for a special meeting in Paris and to show to those interested in the question the results obtained from the working by the Paris Company of regenerative motors such as were designed by M. Bacqueyrisse, general manager and chief of the technical department of the company.

M. Mariage has now suggested for the proposed meeting two days during the week October 20 to 26, very probably the 20th and 21st. The exact dates will be fixed later. The Council has extended an invitation to the members of the Union, and express the hope that many will attend this demonstration since reports will be given of the important economic results obtained by this system of regeneration. The French delegates propose to arrange a reception to which ladies accompanying members are invited. Members are requested to notify their acceptance of the invitation by September 15. Communications should be addressed to M. A. de Backer, secretary-general, 112, Rue du Trône, Brussels.

## LONDON PASSENGER TRAFFIC.

The London County Council's Special Committee on Traffic has prepared a report on passenger traffic in the Greater London Area for the year 1929 and the two preceding years. It is shown that the total number of passenger journeys in 1929 was 3,950 millions, a daily average (on the basis of 365 days) of over 10½ million journeys. The population of Greater London in 1929 was estimated at 7,850,570, and the number of journeys, therefore, was equivalent to 503 for each man, woman and child in the year, or an average for inhabitants of all ages of 1⅓ journeys a head a day.

Tramways still carry over 1,000 million passengers a year. Railways carry less than one-fourth of the total; but it has to be borne in mind that the journeys differ in average value, and that the average length of journey on the railways is considerably more than on the tramways and omnibuses.

The increase in the combined figures for 1929 over 1928, is 1.3 per cent. The increase was greatest on the railways, and of these, it is understood, the highest ratio of increase was on the tube railways.

## BRADFORD TRAMWAY POSITION.

It is reported that the sub-committee appointed by Bradford Tramways Committee to investigate the financial position of the department and to suggest means of attracting further revenue was appointed at the request of the tramway manager, Mr. R. H. Wilkinson. Mr. Wilkinson, it appears, has prepared a long report on the problem, and the chief work of the sub-committee will be to review his comments and suggestions. The total trading loss for the past two years has been just under £36,000, but, in addition to the loss of £29,963 during the year ended March 31 last, the accounts show that £10,000 was paid in rates relief, and a further £19,495 was appropriated from the reserves for various purposes, so that the total drawn on the reserves was £59,458. This leaves only £35,363 in the reserve and renewals fund. Consequently, if a similar trade loss is incurred in the present financial year, it is probable that part of the loss will have to be met by the ratepayers.

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## MUNICIPAL TRAMWAYS AND TRANSPORT ASSOCIATION.

PRIZE WINNERS IN ESSAY COMPETITION.

We have received from Mr. J. Beckett, secretary of the Municipal Tramways and Transport Association, a list of prize winners in the Essay Competition (1930) arranged by the Association. The list is as follows :—

"What is the best basis for the comparison of the working costs of a transport undertaking, whether vehicle mile, seat mile, or other basis ?"

First Prize.—Cheque for £15 and Silver Medal.

Miss Phyllis L. Blakemore, Correspondence Clerk, Wolverhampton Corporation Transport.

Second Prize.—Cheque for £10 and Silver Medal.

Mr. Arthur Ernest Kitchen, Accounting Clerk, Leicester City Tramways and Motor Omnibuses.

"The case for a controlled monopoly of passenger transport within a statutory area."

First Prize.—Cheque for £15 and Silver Medal.

Mr. William John Bracken, Clerical Staff (Claims Department), Liverpool City Tramways.

Second Prize.—Cheque for £10 and Silver Medal.

Mr. John Morgan Powell, Clerk, Pontypridd Urban District Council Tramways.

"Is the present system of ticket check justified, and are the statistics of different classes of tickets sold daily and weekly of sufficient value to the management, having regard to the cost of compiling them ?"

Cheque for £10 and Silver Medal.

Mr. Edward Harry Mason, Outdoor Staff Supervisor, Manchester Corporation Transport.

"Describe the organisation which you consider necessary for an omnibus undertaking of from 50 to 100 'buses : (a) Traffic Department, (b) Garage running staff, (c) Works or repair organisation."

Cheque for £10 and Silver Medal.

Mr. John Jeffrey, Driver, Glasgow City Transport.

"What is the value of welfare work ? What welfare work should a transport undertaking develop ? To what extent should the management take part in such work ? What is the view of the rank and file towards welfare work ?"

Cheque for £10 and Silver Medal.

Mr. John C. Stewart, Sub-station Attendant, Glasgow City Transport.

"Describe the lay-out and equipment for a garage for about 100 'buses."

Cheque for £10 and Silver Medal.

Mr. Herbert Heath, Wireman, Sheffield City Tramways and Motors.

## GLASGOW OMNIBUS SERVICES.

The Town Clerk of Glasgow recently reported to the Magistrates' Committee that an action had been raised in the Court of Session by the Lanarkshire Traction Co., Ltd., in connection with the refusal of the Magistrates' Committee to grant the company certificates for stage carriages, and as to the conditions which might be inserted in such certificates. The Scottish General Transport Co., Ltd., and the Midland 'Bus Services, Ltd., also raised an action to prevent the Magistrates' Committee from prohibiting the vehicles of these companies from plying for hire in the city except under the conditions contained in the stage carriage certificates granted to them for the vehicles and from refusing the certificates.

Subsequently the Town Clerk reported that Lord Sands had refused to grant interim interdict, and that the Lanarkshire Traction Company had, without prejudice to the question raised, lodged applications for certificates to run 15 vehicles into the city in conformity with the approved route, and that these applications had been granted in the licensing court. Lord Sands had also refused to grant interim interdict in the actions by the Scottish General Transport Co., Ltd., and the Midland 'Bus Services, Ltd., to prevent the magistrates from prohibiting the vehicles of these companies from plying for hire in the city, except under conditions contained in the stage carriage certificates granted to them for the vehicles, and had ordered answers to be lodged within seven days. The magistrates then heard Mr. Muir Wilson on behalf of the companies, and agreed, as suggested by Mr. Wilson, that the Chief Constable should meet representatives of the companies and endeavour to adjust the difficulties at issue.

**The Experimental Car at Edinburgh.**—Coun. Adam Miller, convener of Edinburgh Transport Committee, in an interview with a representative of the local "Dispatch" regarding the building of the model tramcar at a cost of £4,000, said that it was an expensive thing, but in London a development manager had been appointed with a salary of £1,200 a year, while at Edinburgh the work was being done by their own manager. The cost was only that of the equipment, and it was a small sum in comparison with the equipment value of the undertaking, which was £857,000. Coun. Miller thought it was a wise policy, particularly as they were preparing a construction programme to last to the end of 1932. The manager of their body building department was making a tour of several of the large English centres, and would report on anything new that he saw. Subsequently, experiments would be made with a car with a longer wheel base. New motors and new brakes would also be tested.

## LONDON TUBE EXTENSION CONTRACT.

Some of the contracts in connection with the extension and improvement of the London tube railways have now been placed. That for the construction of the tunnel section of the Piccadilly tube extension from Finsbury Park to Southgate has been given to Messrs. Charles Brand & Son, of Millbank House, Westminster, London, S.W. Contracts for cast-iron segments, costing £20,000, have been placed in the north of England. This extension will be about 4½ miles, and a further section of three miles to Cockfosters is part of the scheme, but contracts for this, which is above ground, have not yet been placed. The extension at the southern end from Hammersmith to Northfields will be undertaken later in the year.

In connection with these extensions and the reconstruction of stations in central London, including Leicester-square, Dover-street, Hyde Park Corner, Knightsbridge, Marble Arch, Warren-street, and Holborn, about fifty escalators will be required. The contracts for these have been awarded to Waygood-Otis, Ltd., and they will be made in London of British materials.

The total expenditure on these schemes is estimated at about £12,000,000, and it is expected that the work will be completed in about three years.

## MISCELLANEOUS NEWS AND NOTES.

**Halifax Corporation** proposes to order a number of new tramcars at a cost of £20,000.

**Bradford Licensing Committee** has increased the licensing fee in respect of public service vehicles seating 14 persons and upwards, from 2s. 6d. to 5s.

**Falkirk and District Tramways Co.** has made a request to Stirling County Council for a reduction in the company's annual payment of £60 per mile of tramway route.

**Portrush Urban Council** has called a conference of omnibus owners to discuss the erection of a central station for all public service vehicles plying for hire from the town.

**Passengers Cut by Glass.**—Several passengers in a Leigh Corporation omnibus were badly cut by flying glass in a collision on Thursday with a van. The driver of the omnibus was severely cut.

**Commercial Vehicles in Egypt.**—The Department of Overseas Trade report that at the end of June there were registered in Egypt 4,846 trucks and omnibuses. The new registrations during the half-year number 826.

**The Institute of Transport.**—The opening meeting of the new session of the Institute of Transport will be held on October 13, in London, when the Hon. Sir Arthur Stanley will deliver his address as president.

**To Stop Tail-Wagging and Jazzing.**—In their reconstruction programme for the period ending in 1932, Edinburgh Transport Committee propose to experiment with devices with the object of stopping the tail-wagging and jazzing of tramcars.

**Plymouth Corporation** has asked the Watch Committee to report as to the practicability of securing sufficient land to establish a definite tramway centre for all licensed motor omnibuses and coaches plying for hire and entering or leaving the city.

**Late Tramcars for Excursionists.**—The L.M. & S. Railway Co. has arranged with the Manchester Corporation for special tramcars for all main routes to meet excursion trains returning early on Sunday mornings. The arrangement begins on September 13.

**Wireless Accumulators on Ilford Tramcars.**—Notices now appearing in the Ilford tramcars prohibit passengers from taking wireless accumulators inside the cars, owing to the damage that might be caused by acid. They must be left on the conductor's platform.

**Singular Accident at Glasgow.**—Eight persons were injured when a tramcar was partially wrecked in Gallowgate, Glasgow, on September 2. A large plank lying in the track between the rails, which were being repaired, was caught by the lifeguard and forced through the bottom of the car.

**Llanelly Council** is shortly to discuss at a special meeting the purchase of the local tramways and the substitution of trolleybuses. The Llanelly Light & Traction Co., recently acquired Parliamentary powers under which they are able to run trolleybuses over their tramway routes and extensions.

**Licence Badges in London.**—Scotland Yard has decided to abandon the clumsy licence badges which omnibus drivers, tramway drivers, and taxicab men have hitherto had to wear. The new badge, much lighter, is now available for taxicab men, and later a smaller badge will be provided for bus and tramway drivers.

**One-Man Omnibus in Outer London.**—The London General Omnibus Co. is experimenting with one-man operated single-deck omnibuses in the Uxbridge district. Six vehicles, each seating 18 passengers, are in service. Passengers enter through a door at the side of the driver, to whom the fares are paid.

**Attacking the Litter Habit.**—The latest notice shown on London General omnibuses in connection with the campaign against littering the streets reads as follows : "Please tear your ticket in half and leave it in the 'bus." Holborn Borough Council and Hove Corporation have made a by-law under which people who litter the pavements are liable to prosecution.

**Aberdeen's Record Year.**—At the annual inspection of the Aberdeen transport undertaking on August 19, Mr. J. L. Gunn, the general manager and engineer, announced that the tramways had concluded a record year in the history of the undertaking. Passengers had increased by 3,750,000. He had seen about fifty municipal accounts for the past year, and in working expenses Aberdeen, so far, came out second.

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**Omnibus Garage at Torquay.**—Torquay Plans Committee has approved the plans submitted by the Devon Omnibus and Touring Company, Ltd., for the erection of a garage and workshops in Newton-road, subject to (*a*) a circular area for cars being provided in front of the building, (*b*) a separate entrance and exit for vehicles, and (*c*) details of steel structural work being satisfactory.

**Summoned for Failure to Avoid Collision.**—Two Manchester Corporation motormen were summoned at Hyde on August 14 for failure to stop their cars when a collision occurred. It was stated that each driver had a clear view for 300 yards. The magistrates decided that there was no evidence to show how the accident occurred, but added that the collision should not have taken place.

**Erith Tramways' 25th Anniversary.**—August 26 was the twenty-fifth anniversary of the opening of the Erith Urban Council tramways. During the past financial year they carried 4,659,282 passengers. The average fare of .78d. per mile is the cheapest in the Metropolitan area, except on the L.C.C. tramways. The present fleet consists of nineteen cars, being five more than when the service was opened.

**The Tramcar Conductor's Platform.**—At an inquest at Islington on a woman who fell from a tramcar which started as she was boarding it at a request stop, it was stated that the conductors are only bound to be on their platforms at compulsory stopping places. Returning a verdict of "Accidental death," the jury added a rider that conductors should be on the platforms at all stopping places.

**Dublin Track Alterations.**—Dublin City Commissioners have decided on improvements in a number of streets, and to repair O'Connor Bridge. The tramway tracks on the bridge will be altered to facilitate traffic at a cost of £10,000. The Tramways Company have agreed to the arrangement, providing the cost does not fall upon them, although they would prefer that the rails should remain as at present.

**Proposed Warsop-Nottingham Bus Service.**—A Ministry of Transport Inquiry was held at Nottingham on August 26 regarding an application by Messrs. Baker Bros., of Warsop, to run omnibuses between Warsop and Nottingham via Mansfield. The Nottingham Watch Committee had refused to grant a licence on the ground that the route from Nottingham to Mansfield was already adequately served. The decision of the Ministry will be announced later.

**Merthyr-Cardiff Omnibus Service.**—Arrangements for the omnibus service between Cardiff and Merthyr are now being made. It will be run jointly by Merthyr Corporation and the Rhondda Tramways Co. The fares will be 2s. 5d. single and 3s. return between the termini, with intermediate stages. The omnibuses of the Merthyr and Cardiff Corporations may pick up and set down the same passengers within the area between Whitchurch and Kingsway, Cardiff, and in the Merthyr area.

**Special Bus Service for a School.**—Owing to the closing of the London, Midland & Scottish Railway Station at Bolsover to passenger traffic, the Governors of Staveley Grammar School have arranged for special omnibuses to leave Bolsover Market Place at 8.30 a.m. on weekdays. The vehicles will run via Shutlewood to the school, returning at 4 p.m. The new service began on September 4 when the school reopened, and special tickets for the term have been arranged.

**Altrincham Tramcars Question.**—The agreement between Manchester Corporation and Altrincham Urban Council for the running of tramcars into Altrincham expired in May last. In view of strongly-worded opinion against the tramcars by Altrincham residents who desire omnibus services to be substituted, negotiations are proceeding between the two authorities. So far no definite decision has been made, but it is believed that the introduction of double-deck omnibuses is being favourably considered.

**South Shields Deficit Explained.**—In the annual report on South Shields transport undertaking, Mr. J. Austin Baker, general manager and engineer, says that there is no doubt that the omnibus services could be made profitable, but as long as technical advice and expert views are ignored, and as long as the Tramway Committee's decisions are reversed, so long will the deficit continue. Mr. Baker adds that during the past five years the omnibus services have been chopped and changed in such a manner that it has been impracticable for a definite policy to be followed, and the public are the sufferers.

**New Road Material for Leeds Tramways.**—Leeds Tramways Department is laying down a new road material which is said to be practically indestructible, to be non-skidding, and to reduce noise. Its basis is silica and bitumen. It has already been tested in various parts of Leeds during the past eighteen months, and it is now being laid on a mile of track in Dewsbury-road. The Tramways Department believe it is the ideal material for surfacing that part of the road for which they are responsible. Mr. R. L. Horsfield, the general manager of the tramways, says that being laid cold, it is ready for traffic in a few hours, and it can be laid in all weathers.

**Fines for Overloading Omnibuses.**—Eight omnibus conductors were summoned at Formby for allowing their omnibuses to be overcrowded. One of them said he was sent from Liverpool as one of a number of extra buses to pick up passengers at Southport. At Freshfield he met a group of people with children who were drenched with rain, and he thought it would be a greater sin to leave them where they were than to take them on board. Superintendent Myers said the conductors were setting the Court at defiance. It was a serious thing for buses to be overcrowded. The Chairman, Col. Formby, said the Bench thought there was a good deal in what the defendant had said, but they could not have omnibuses overcrowded. A fine of 10s. was imposed. Other defendants were fined £1.

**Glasgow Traffic Increase.**—At a meeting of the Glasgow Transport Committee on September 3, a notable increase in revenue was reported. From May 31 to August 30 there was an increase in the receipts from the tramways, omnibuses and subway of nearly £40,000 compared with the corresponding quarter of 1929. The number of tickets issued showed an increase of 6,500,000.

**Fewer Road Fatalities in London.**—A report issued by the Metropolitan Police on accidents in the streets during April, May and June last shows that there were 33,258 accidents, 15,910 persons injured, and 339 killed. For the corresponding months of 1929 the figures were: 32,216, 16,069, and 364. A year ago the average number killed each day was 4; to-day it is 3.7.

**Law of Property Found in Tramcars.**—Mr. D. Stenhouse, Town Clerk of Glasgow, has replied in the local press to the statement made by the stipendiary magistrate, reported in our issue of August 23, that a passenger finding property in a tramcar is not bound to give it up, but should take it to the police. Mr. Stenhouse quoted section 79 of the Glasgow Corporation (Tramways Consolidation) Order, 1905, which provides that property found in the cars shall forthwith be delivered to the conductor, who shall take it to the place appointed by the Corporation, and if unclaimed within six months it may be sold. Any finder failing or refusing to give up such property is guilty of an offence.

**Manchester Tramwaymen's Grievances.**—Employees of the Manchester Corporation Tramways held a midnight meeting on August 30 to discuss their grievances. Excessive overtime was alleged, and it was decided to press for an inquiry to ascertain how many men might be employed if overtime were abolished. It was also stated that the Transport Committee intended gradually to abolish the trolley boy, and the meeting urged the placing of all trolley boys in adult positions in the undertaking at the age of 19. Protests were made against the speeding-up policy, and steps were to be taken for drastic action against those who were still non-unionists at the end of the present campaign.

**Ulster Passenger Combine.**—In the course of a few weeks, the Belfast and County Down Railway, which has been operating an omnibus service between Belfast and Hollywood, is likely to encounter competition. What is known as the "Ulster Passenger Combine" proposes to run vehicles on the route for the benefit of its members, to whom are being held out the prospects of cheaper fares, and a share of the profits, if any, of the undertaking. Other routes are to be served if the membership increases. Membership of the Combine can be secured on payment of 1s., which, it is said, will be the only charge made apart from the cost of travelling. The scheme is being promoted by Mr. Thomas M'Clements, of 33, Grove-street, Belfast.

**New Omnibuses for Aberdeen.**—At a meeting of Aberdeen Town Council on Monday a discussion took place on the recommendation of the Tramways Committee for the purchase of fourteen 52-seat double-deck omnibuses. Councillor George, convener of the Tramways Committee, said that two local firms' prices for the bodies was £2,065 more than the prices quoted by southern firms, and delivery would take eight months if the order was given to one firm or twenty weeks if divided between the two, but outside firms would supply them in ten weeks. The Committee adhered to its recommendation that the fourteen Crossley chassis should be bought, but the Council decided that fresh tenders should be asked from coachbuilders both in Aberdeen and elsewhere, in accordance with specifications.

**Buenos Aires New Underground Railway** is expected to be opened for traffic shortly. The line, which is 5½ miles long, runs from Buenos Aires Central Railway terminus to Callao. The first section of 4½ miles cost about £4,000,000. Fifty-six cars, which have been constructed by the Metropolitan-Cammell Carriage Wagon and Finance Co., will be delivered shortly. Each car is equipped with motors. It is reported by the local correspondent of the "Electrical Review" that the municipality of Buenos Aires has approved of a scheme submitted by the Compania Anonima de Projectos y Construcciones de Madrid for an extension of the underground electric railways. A later cabled report states that the scheme has been approved of by the Deliberative Council, although the Intendente had pronounced against it.

## PERSONAL.

**Mr. E. B. Blainey,** of Barry, has been appointed manager of Gellygaer Urban Council omnibus department.

**Sir Robert Harvey,** a director of the Lima Light Power and Tramways Co., who died on March 14 last, left estate of the gross value of £276,874, with net personalty of £253,954.

**Mr. G. H. Lake,** on terminating his service as electrical engineer at Derby in order to fill a similar position at Nottingham, has been presented by the staff with a Crown Derby china tea set.

## CONTRACTS.

**Sheffield Tramways Committee** has placed a contract with J. Brown & Co., Ltd., for 500 steel tyres for car wheels.

**Glasgow Transport Committee** has placed a contract for a steel cable required for the subway. The length of the cable is more than seven miles and the cost about £3,000.

**The Central Electricity Board** has accepted the tender of W. T. Henley's Telegraph Works, Ltd., for the supply and installation of cables in connection with the South-East England electricity scheme.

**Wigan Town Council** has accepted the tender of Leyland Motors, Ltd., for ten double-deck omnibuses and twenty chassis at a total cost of £35,480. Orders for additional vehicles are being considered.

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## TRAFFIC RECEIPTS.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended September 3 amounted to £80,475, a decrease of £1,992 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to September 3 (22 2-7 weeks), the total receipts were £1,839,871, a decrease of £13,370.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended August 16 give total receipts of £412,336, or £3,337 less than in the corresponding week of last year. The aggregate receipts for twenty weeks amounted to £8,449,765, an increase of £114,041 over the corresponding period of last year.

**Aberdeen Tramways Committee** has decided to recommend a reduction of 20 to 25 per cent. on omnibus season tickets.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks. | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | Aug. 19 | 517 | 512 | − 5 | 20 | 11,600 | − 222 |
| „ Motor Buses ... | „ 19 | 210 | 277 | + 67 | 20 | 5,870 | + 994 |
| „ Total ... ... | „ 19 | 727 | 789 | + 62 | 20 | 17,470 | + 772 |
| Aberdeen Corp. ... | „ 27 | 5,420 | 5,593 | + 173 | 12¾ | 73,416 | + 820 |
| Ashton-u-Lyne Corp. | „ 30 | 923 | 843 | − 80 | 22 | 18,843 | − 1,417 |
| „ Motor Buses ... | „ 30 | 470 | 481 | + 11 | 22 | 11,021 | + 44 |
| „ Trolley Buses ... | „ 30 | 276 | 256 | − 20 | 22 | 5,759 | − 381 |
| „ Total ... ... | „ 30 | 1,669 | 1,580 | − 89 | 22 | 35,623 | − 1,754 |
| Ayr Corporation ... | „ 30 | 680 | 636 | − 44 | 15 | 10,646 | − 863 |
| Barrow Corporation... | „ 30 | 616 | 647 | + 31 | 22 | 13,056 | − 1,026 |
| „ Motor Buses ... | „ 30 | 456 | 476 | + 20 | 22 | 9,377 | + 774 |
| „ Total ... ... | „ 30 | 1,072 | 1,123 | + 51 | 22 | 22,433 | − 252 |
| Belfast City ... ... | „ 29 | 11,068 | 12,413 | +1,345 | 21¼ | 248,059 | + 8,034 |
| „ Motor Buses ... | „ 29 | 975 | 1,189 | + 214 | 21¼ | 28,081 | + 5,948 |
| „ Total ... ... | „ 29 | 12,043 | 13,602 | + 1,559 | 21¼ | 276,140 | + 13,982 |
| Birkenhead Corp. ... | „ 31 | 1,682 | 1,465 | − 217 | 22 | 34,289 | − 3,544 |
| „ Motor Buses ... | „ 31 | 3,557 | 4,263 | + 706 | 22 | 82,661 | − 2,397 |
| „ Total ... ... | „ 31 | 5,239 | 5,728 | + 489 | 22 | 116,950 | − 5,941 |
| Birmingham Corp. ... | „ 26 | 26,311 | 25,081 | − 1,230 | 21 | 552,996 | − 15,100 |
| „ Motor Buses ... | „ 26 | 12,630 | 15,392 | + 2,762 | 21 | 321,573 | + 52,929 |
| „ Trolley Buses ... | „ 26 | 542 | 503 | − 39 | 21 | 11,467 | − 53 |
| „ Total ... ... | „ 26 | 39,483 | 40,976 | + 1,493 | 21 | 886,036 | + 37,776 |
| Blackburn Corp. ... | „ 13 | 1,963 | 1,734 | − 229 | 19¾ | 35,620 | − 3,110 |
| „ Motor Buses ... | „ 13 | Nil | 311 | + 311 | 19¾ | 6,252 | + 6,252 |
| „ Total ... ... | „ 13 | 1,963 | 2,045 | + 82 | 19¾ | 41,872 | + 3,142 |
| Bradford Corporation | „ 30 | 14,895 | 14,234 | − 661 | 22 | 311,724 | − 13,545 |
| Brighton Corporation | „ 31 | 3,413 | 3,683 | + 270 | 21¾ | 64,499 | + 2,241 |
| Burnley Corporation... | „ 30 | 3,039 | 2,688 | − 351 | ... | ... | ... |
| „ Motor Buses ... | „ 30 | 652 | 677 | + 25 | ... | ... | ... |
| „ Total ... ... | „ 30 | 3,691 | 3,365 | − 326 | | | ... |
| Burton-on-Trent Corp. | „ 31 | 804 | 826 | + 22 | 22 | 18,586 | + 620 |
| Bury Corporation ... | „ 31 | 2,004 | 1,908 | − 96 | 21½ | 39,982 | − 4,847 |
| „ Motor Buses ... | „ 31 | 548 | 1,146 | + 598 | 21½ | 24,229 | + 14,700 |
| „ Total ... ... | „ 31 | 2,552 | 3,054 | + 502 | 21½ | 64,211 | + 9,853 |
| Cardiff Corporation ... | „ 2 | 7,502 | 7,891 | + 389 | 17½ | 138,887 | + 2,978 |
| Chatham and District | „ 28 | 1,483 | 1,388 | − 95 | 34 | 39,626 | + 641 |
| Chester Corporation ... | „ 31 | 435 | Nil | − 435 | 22 | Nil | − 9,869 |
| „ Motor Buses ... | „ 31 | Nil | 689 | + 689 | 22 | 14,692 | + 14,692 |
| „ Total ... ... | „ 31 | 435 | 689 | + 254 | 22 | 14,692 | + 4,823 |
| Chesterfield Corp. ... | Sept. 1 | 1,946 | 1,877 | − 69 | 22 | 41,916 | + 1,099 |
| Colchester Corp. ... | „ 3 | 589 | 644 | + 55 | 23 | 14,171 | + 1,561 |
| Colne Corporation ... | „ 3 | 758 | 698 | − 60 | 23 | 15,880 | − 210 |
| Coventry Corporation | Aug. 31 | 2,057 | 1,917 | − 140 | 22 | 43,992 | − 2,855 |
| „ Motor Buses ... | „ 31 | 1,567 | 1,776 | + 209 | 22 | 39,761 | + 5,273 |
| „ Total ... ... | „ 31 | 3,624 | 3,693 | + 69 | 22 | 83,753 | + 2,418 |
| Darlington Corp. ... | „ 30 | 1,000 | 1,049 | + 49 | 21⅞ | 23,185 | + 2,023 |
| Derby Corporation ... | „ 30 | 2,607 | 2,422 | − 185 | 22 | 53,779 | − 1,337 |
| „ Motor Buses ... | „ 30 | 785 | 907 | + 122 | 22 | 20,023 | + 4,463 |
| „ Total ... ... | „ 30 | 3,392 | 3,329 | − 63 | 22 | 73,802 | + 3,126 |
| Dover Corporation ... | „ 30 | 556 | 626 | + 70 | 22 | 9,847 | + 342 |
| Dundee Corporation... | „ 19 | 2,633 | 2,667 | + 34 | 13½ | 35,171 | − 1,088 |
| „ Motor Buses ... | „ 19 | 838 | 1,204 | + 366 | 13½ | 15,000 | + 3,616 |
| „ Total ... ... | „ 19 | 3,471 | 3,871 | + 400 | 13½ | 50,171 | + 2,528 |
| East Ham Corp. ... | „ 30 | 2,324 | 2,325 | + 1 | 21½ | 50,072 | + 733 |
| Edinburgh Corp. ... | „ 23 | 13,348 | 13,913 | + 565 | 14½ | 221,004 | + 5,416 |
| „ Motor Buses ... | „ 23 | 3,285 | 3,600 | + 315 | 14½ | 55,792 | + 4,561 |
| „ Total ... ... | „ 23 | 16,633 | 17,513 | + 880 | 14½ | 276,796 | + 9,977 |
| Exeter Corporation ... | Sept. 3 | 968 | 837 | − 131 | 23 | 18,737 | − 1,278 |
| „ Motor Buses ... | „ 3 | 182 | 413 | + 231 | 23 | 7,089 | + 3,931 |
| „ Total .. ... | „ 3 | 1,150 | 1,250 | + 100 | 23 | 25,819 | + 2,653 |
| Glasgow Corporation... | Aug. 30 | 43,387 | 44,042 | + 655 | 13 | 553,038 | + 2,073 |
| „ Motor Buses ... | „ 30 | 5,654 | 8,859 | + 3,205 | 13 | 104,896 | + 40,092 |
| „ Total ... ... | „ 30 | 49,041 | 52,901 | + 3,860 | 13 | 657,934 | + 42,165 |
| Gloucester Corp. ... | „ 27 | 596 | 737 | + 141 | 21¾ | 15,243 | + 3,291 |
| Grimsby Corporation | „ 30 | 1,594 | 1,852 | + 258 | 22 | 35,220 | + 3,858 |
| Halifax Corporation | „ 26 | 4,732 | 5,201 | + 469 | 21¼ | 110,005 | + 12,667 |
| Huddersfield Corp. ... | „ 30 | 6,680 | 6,559 | − 121 | 22 | 139,999 | − 1,529 |
| Hull Corporation ... | „ 30 | 5,899 | 5,555 | − 344 | 22 | 124,469 | − 2,636 |
| „ Motor Buses ... | „ 30 | 1,385 | 1,697 | + 312 | 22 | 34,034 | + 4,913 |
| „ Total ... ... | „ 30 | 7,284 | 7,252 | − 32 | 22 | 158,503 | + 2,277 |
| Ilford Corporation ... | „ 30 | 1,462 | 1,456 | − 6 | 21½ | 32,944 | + 616 |
| Ipswich Corp. Trol.Bus | „ 30 | 1,399 | 1,442 | + 43 | 21½ | 29,703 | + 1,660 |
| Isle of Thanet ... | „ 27 | 2,524 | 2,066 | − 458 | 34½ | 29,465 | − 3,228 |
| Kilmarnock Corp. ... | „ 30 | 482 | 506 | + 24 | 15½ | 7,506 | + 303 |
| Lancashire Un. ... | „ 24 | 2,251 | 2,144 | − 107 | 33½ | 72,038 | − 3,730 |
| „ Motor Buses ... | „ 24 | 4,834 | 5,140 | + 306 | 33½ | 166,312 | + 23,203 |
| Leeds Corporation ... | „ 30 | 19,925 | 20,115 | + 190 | 21½ | 435,601 | + 9,357 |
| Leicester Corp. ... | „ 30 | 8,361 | 8,322 | − 39 | 22 | 181,962 | + 814 |
| Lincoln Corp. ... | „ 24 | 909 | 961 | − 8 | 21 | 19,724 | + 70 |
| Liverpool Corp. ... | „ 30 | 30,078 | 30,640 | + 562 | 21½ | 656,651 | + 839 |
| London County Coun. | Sept. 3 | 82,467 | 80,475 | − 1,992 | 22¼ | 1,839,871 | − 13,370 |
| Luton Corporation ... | Aug. 27 | 436 | 424 | − 12 | 21½ | 9,157 | + 306 |
| Maidstone Corp. ... | „ 28 | 165 | Nil | − 165 | 21½ | Nil | − 4,972 |
| „ Motor Buses ... | „ 28 | 315 | 285 | − 30 | 21½ | 6,004 | − 254 |
| „ Trolley Buses ... | „ 28 | 305 | 587 | + 282 | 21½ | 13,277 | + 6,646 |
| „ Total ... ... | „ 28 | 785 | 872 | + 87 | 21½ | 19,281 | + 1,420 |
| Manchester Corp. ... | „ 30 | 34,806 | 31,345 | − 3,461 | 22 | 700,552 | − 62,145 |
| „ Motor Buses ... | „ 30 | 4,894 | 8,731 | + 3,837 | 22 | 188,501 | + 83,528 |
| „ Total ... ... | „ 30 | 39,700 | 40,076 | + 376 | 22 | 889,053 | + 21,383 |
| Middlesbrough Corp. | „ 26 | 1,276 | 1,061 | − 215 | 21½ | 22,197 | − 1,902 |
| „ Motor Buses ... | „ 26 | 541 | 555 | + 14 | 21½ | 12,154 | + 1,215 |
| „ Total ... ... | „ 26 | 1,817 | 1,616 | − 201 | 21½ | 34,351 | − 687 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks. | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty Corp. | Aug. 23 | 10,209 | 8,397 | − 1,812 | 20⅝ | 181,865 | − 27,343 |
| „ Motor Buses ... | „ 23 | 2,061 | 3,304 | + 1,243 | 20⅝ | 64,285 | + 21,278 |
| „ Total ... ... | „ 23 | 12,270 | 11,701 | − 569 | 20⅝ | 246,150 | − 6,065 |
| Newport Corporation | „ 16 | 1,598 | 1,488 | − 110 | 20 | 31,923 | − 1,421 |
| „ Motor Buses ... | „ 16 | 740 | 750 | + 10 | 20 | 16,225 | + 1,119 |
| „ Total ... ... | „ 16 | 2,338 | 2,238 | − 100 | 20 | 48,148 | − 302 |
| Northampton Corp. ... | „ 29 | 1,091 | 1,092 | + 1 | 21¾ | 23,644 | − 440 |
| „ Motor Buses ... | „ 29 | 724 | 741 | + 17 | 21¾ | 15,760 | + 1,445 |
| „ Total ... ... | „ 29 | 1,815 | 1,833 | + 18 | 21¾ | 39,404 | + 1,005 |
| Nottingham Corp. ... | „ 28 | 6,542 | 5,454 | − 1,088 | 21¾ | 123,832 | − 18,571 |
| „ Motor Buses ... | „ 28 | 2,292 | 3,345 | + 1,053 | 21¾ | 71,405 | + 22,818 |
| „ Trolley Buses ... | „ 28 | 570 | 1,181 | + 611 | 21¾ | 25,760 | + 13,150 |
| „ Total ... ... | „ 28 | 9,404 | 9,980 | + 576 | 21¾ | 220,997 | + 17,397 |
| Oldham Corporation | „ 30 | 3,753 | 3,661 | − 92 | 23 | 77,121 | − 4,971 |
| „ Motor Buses ... | „ 30 | 2,087 | 2,056 | − 22 | 23 | 46,017 | − 1,153 |
| „ Total ... ... | „ 30 | 5,831 | 5,717 | − 114 | 23 | 123,138 | − 6,124 |
| Plymouth Corp. ... | „ 30 | 4,062 | 4,042 | − 20 | 21 | 81,278 | − 3,304 |
| „ Motor Buses ... | „ 30 | 2,032 | 2,668 | + 636 | 21 | 53,883 | + 11,489 |
| „ Total ... ... | „ 30 | 6,094 | 6,710 | + 616 | 21 | 135,161 | + 8,185 |
| Portsmouth Corp. ... | „ 30 | 6,131 | 5,878 | − 253 | 22 | 98,150 | − 8,121 |
| „ Motor Buses ... | „ 30 | 2,672 | 4,384 | + 1,712 | 22 | 76,669 | + 30,118 |
| „ Total ... ... | „ 30 | 8,803 | 10,262 | + 1,459 | 22 | 174,819 | + 21,997 |
| Preston Corporation... | „ 27 | 1,790 | 1,654 | − 136 | 21¾ | 35,593 | − 1,808 |
| „ Motor Buses ... | „ 27 | 503 | 516 | + 13 | 21¾ | 11,077 | + 667 |
| „ Total ... ... | „ 27 | 2,293 | 2,170 | − 123 | 21¾ | 46,670 | − 1,141 |
| Rawtenstall Corp. ... | „ 31 | 852 | 625 | − 227 | 21½ | 14,236 | − 4,285 |
| „ Motor Buses ... | „ 31 | 479 | 736 | + 257 | 21½ | 15,396 | + 3,899 |
| „ Total ... ... | „ 31 | 1,331 | 1,361 | + 30 | 21½ | 29,632 | − 386 |
| Reading Corporation | „ 28 | 1,579 | 1,513 | − 66 | 22 | 31,099 | − 1,395 |
| „ Motor Buses ... | „ 28 | 957 | 1,037 | + 80 | 22 | 21,878 | + 2,000 |
| „ Total ... ... | „ 28 | 2,536 | 2,550 | + 14 | 22 | 52,977 | + 605 |
| Rochdale Corp. ... | „ 30 | 2,776 | 2,746 | − 30 | ... | 60,211 | − 4,581 |
| „ Motor Buses ... | „ 30 | 1,558 | 1,523 | − 35 | ... | 34,144 | + 243 |
| „ Total ... ... | „ 30 | 4,334 | 4,269 | − 65 | ... | 94,355 | − 4,338 |
| Rotherham Corp. ... | Sept. 1 | 2,668 | 2,615 | − 53 | 22 | 60,467 | + 1,975 |
| Salford Corporation ... | Aug. 31 | 11,060 | 10,785 | − 275 | 21¾ | 244,375 | + 1,119 |
| Sheffield Corp. ... | „ 30 | 20,830 | 20,075 | − 755 | 21¾ | 447,870 | − 11,955 |
| Southampton Corp. ... | „ 27 | 3,650 | 3,764 | + 114 | 22 | 75,535 | + 1,733 |
| „ Motor Buses ... | „ 27 | 840 | 889 | + 49 | 22 | 18,870 | + 2,445 |
| „ Total ... ... | „ 27 | 4,490 | 4,653 | + 163 | 22 | 94,405 | + 4,178 |
| Southend-on-Sea Corp. | „ 27 | 3,359 | 3,027 | − 332 | 21¾ | 50,067 | − 2,929 |
| „ Trolley Buses ... | „ 27 | 412 | 468 | + 56 | 21¾ | 7,206 | + 2,761 |
| „ Total ... ... | „ 27 | 3,771 | 3,495 | − 276 | 21¾ | 57,273 | − 168 |
| Southport Corp. ... | „ 30 | 1,784 | 1,742 | − 42 | 21½ | 30,783 | − 565 |
| „ Motor Buses ... | „ 30 | 548 | 629 | + 81 | 21½ | 10,013 | + 970 |
| „ Total ... ... | „ 30 | 2,332 | 2,371 | + 39 | 21½ | 40,796 | + 405 |
| St. Helens Corp. ... | „ 26 | 1,988 | 2,034 | + 46 | 21¼ | 43,349 | + 2,498 |
| Sunderland Corp. ... | Sept. 2 | 2,540 | 2,377 | − 163 | 22 | 56,934 | + 1,681 |
| „ Motor Buses ... | „ 2 | 298 | 864 | + 566 | 22 | 12,554 | + 7,880 |
| „ Total ... ... | „ 2 | 2,838 | 3,241 | + 403 | 22 | 69,488 | + 9,561 |
| Swindon Corp. .. | Aug. 27 | 940 | 1,076 | + 136 | 21¾ | 21,245 | + 4,522 |
| Wallasey Corp. ... | „ 30 | 1,393 | 1,376 | − 17 | 21⅞ | 28,122 | − 2,406 |
| „ Motor Buses ... | „ 30 | 2,240 | 2,843 | + 603 | 21⅞ | 54,055 | + 5,034 |
| „ Total ... ... | „ 30 | 3,633 | 4,219 | + 586 | 21⅞ | 82,177 | + 2,628 |
| Walsall Corporation... | „ 24 | 3,405 | 3,400 | − 5 | 21 | 72,557 | + 1,220 |
| Walthamstow Corp. ... | „ 30 | 2,624 | 2,533 | − 92 | 21⅝ | 54,220 | − 115 |
| Warrington Corp. ... | „ 28 | 873 | 867 | − 6 | 22 | 19,321 | + 42 |
| „ Motor Buses ... | „ 28 | 442 | 483 | + 41 | 22 | 14,950 | + 1,267 |
| „ Total ... ... | „ 28 | 1,315 | 1,350 | + 35 | 22 | 34,271 | + 1,309 |
| West Ham Corp. ... | „ 28 | 6,169 | 5,884 | − 285 | 21¾ | 130,054 | + 1,514 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | „ 24 | 2,880 | 2,423 | − 457 | 21 | 51,694 | − 7,794 |
| „ Trolley Buses ... | „ 24 | 3,448 | 3,449 | + 1 | 21 | 73,622 | + 3,764 |
| „ Total ... ... | „ 24 | 6,328 | 5,872 | − 456 | 21 | 125,316 | − 4,030 |
| York Corporation ... | „ 27 | 1,457 | 1,461 | + 4 | 22 | 22,955 | − 50 |
| „ Motor Buses ... | „ 27 | 506 | 617 | + 111 | 22 | 11,066 | + 2,769 |
| „ Trolley Buses ... | „ 27 | 66 | Nil | − 66 | 22 | Nil | − 1,125 |
| „ Total ... ... | „ 27 | 2,029 | 2,078 | + 49 | 22 | 34,021 | + 1,594 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or *M* | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Sept. 2 | £82,455 | £71,854 | 35 w | £2,881,383 | − £134,503 |
| Brazilian Traction $ | July | 4,335,895 | 4,081,018 | 7 *m* | 28,367,377 | − 5,543 |
| British Columbia $ | July | 1,156,720 | 1,196,239 | 1 *m* | 1,196,239 | + 39,519 |
| Buenos Aires Lacroze | Aug. 31 | 11,645 | 10,913 | 9 w | 94,744 | − 8,322 |
| Burma E. Sup. Co. Rs. | July | 64,649 | 66,444 | 12 *m* | 776,289 | − 17,071 |
| Calcutta ... Rs. | Aug. 31 | 121,393 | 103,356 | 34½ w | 3,865,927 | − 543,336 |
| Cape Town ... ... | July | 27,779 | 24,953 | ... | ... | .. |
| Cartbagena & Herrerias | Aug. | 1,169 | 505 | 8 *m* | 6,855 | − 1,235 |
| Durban Corporation | July | 29,110 | 27,049 | 12 *m* | 288,972 | − 3,643 |
| East India ... ... | Aug. | 4,152 | 3,948 | 1 *m* | 3,948 | − 204 |
| Kalgoorlie ... ... | May | 1,747 | 1,815 | 5 *m* | 8,134 | − 68 |
| Madras (2 weeks) Rs. | Aug. 31 | 45,618 | 47,245 | 34 w | 741,958 | + 37,253 |
| Para ... ... | July | 15,044 | 14,816 | 8 *m* | 118,623 | + 521 |
| Port Elizabeth ... | July | 7,503 | 7,045 | ... | ... | ... |
| Rangoon ... Rs. | Aug. | 123,550 | 146,320 | 8 *m* | 1,197,255 | + 242,264 |
| Shanghai ... $ | June | 335,740 | 367,231 | 6 *m* | 1,923,202 | − 42,708 |
| Singapore ... ...$ | July | 131,000 | 145,000 | 10 *m* | 1,368,000 | + 154,000 |
| Winnipeg .. ...$ | July | 497,935 | 452,212 | 7 *m* | 3,725,716 | − 112,297 |

## RAILWAY RECEIPTS.

| 35th Week ended Aug. 31st | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 326,000 | − 4,000 | 334,000 | − 28,000 | 660,000 | − 32,000 | − 937,000 |
| L.M.S.R. | 640,000 | − 52,000 | 765,000 | − 104,000 | 1,405,000 | − 156,000 | −2,951,000 |
| L.N.E.R. | 445,000 | − 38,000 | 632,000 | − 112,000 | 1,077,000 | − 150,000 | −1,896,000 |
| S.R. | 430,000 | − 14,000 | 127,000 | − 3,000 | 557,000 | − 17,000 | − 331,000 |
| Totals | 1,841,000 | − 108,000 | 1,858,000 | − 247,000 | 3,699,000 | − 355,000 | −6,115,000 |

## ELECTRIC RAILWAYS.

| Name | Week Ended. | Latest Return. 1929. | 1930. | + or − | Aggregate. 1930. | + or − |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Aug. 30 | 290,600 | 295,600 | + 5,000 | 10,526,700 | + 614,100 |
| Lond. & Sub. Group | „ 30 | 44,900 | 45,500 | + 600 | 1,545,000 | + 100,300 |
| Metropolitan Railway | „ 30 | 35,600 | 34,600 | − 1,000 | 1,282,000 | + 21,400 |
| Liverpool Overhead | „ 31 | 1,757 | 1,795 | + 38 | 55,427 | − 3,874 |
| Mersey Railway ... | „ 30 | 4,130 | 4,171 | + 41 | 158,875 | + 3,938 |

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THE
Tramway AND Railway World
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LONDON, SEPTEMBER 13, 1930.

## AN OMNIBUS RETROSPECT.

The comparatively small band of committeemen and general managers who attended pre-war conferences of the Municipal Tramways Association and who will be present at this year's conference, will find themselves mentally measuring the progress of the motor omnibus and the trolleybus during the intervening sixteen years. A number of events will naturally turn their thoughts in that direction. To an organisation that now includes "transport" in its title, Councillor Gledhill, of Halifax, will discourse on the transition of transport during the short period of the past three years. Brief as that time is, it has, thanks to the pneumatic tyre, been marked by the two vehicles attaining a stage of improvement not dreamed of a decade ago. Another notable change is the co-operation of the railway companies as equal partners in great company omnibus undertakings, and also in a number of municipal omnibus enterprises. Not the least important feature of the transition is the Road Traffic Act, various parts of which will be coming into operation during the next three months. The prospect of further progress of no mean order will be revealed by Mr. Vane Morland's review of the development of the heavy oil engine. A transportation event by road that would not have been attempted in the pre-war era will mark the closing day of the conference. In contrast to the comfortless vehicles of 1914, luxurious coaches will transport the members twenty-five miles from Harrogate to Huddersfield, returning in the afternoon via Leeds. Members who recall the timidity and even hostility with which the motor omnibus was treated at conferences prior to 1914 will find an excuse for the attitude then adopted. The machine at that time was an altogether inferior one. That being so, it is not surprising that the discussions as to its use did not envisage a greater scope than testing of routes, acting as feeders, and working up a service to the stage where a tramway might be constructed. With the vast improvement effected in the omnibus since the war, it is safe to say that no service from an outer district now transfers the passengers to the cars at a terminus. Objection by passengers to such a course resulted years ago in the omnibus continuing to the centre of the town over the tramway routes. The management has had to ensure the running of the two classes of vehicles with a measure of co-ordination. Generally the tramcar will be found catering for short distance and heavy traffic, the omnibus providing for longer distance passengers. When the pneumatic tyre for omnibuses was unknown, a leading London operator advocated the use of the omnibus for pick-up traffic, but it is now plainly inadvisable to adopt that course. The reason is that the present speed limit of 20 m.p.h. for air tyres gives the omnibus an advantage over the tramcar in both narrow and wide streets. That advantage will be greatly augmented when the limit is increased to 30 m.p.h. under the Road Traffic Act. It will especially benefit the express services which during the past two or three years have accentuated the merits of the omnibus. Early advocates and opponents of the omnibus little imagined that the day would come when petrol and trolley omnibuses would in certain circumstances displace a considerable number of tramway undertakings. All this progress will not render out of place the tribute that Councillor Gledhill may pay to tramway undertakings for the transformation that many have undergone.

### AMERICAN TRACTION EXPERIMENTS.

The Twin City Rapid Transit Co., of St. Paul and Minneapolis, are making some interesting experiments with light-weight trucks, by which it is hoped to effect a saving in the cost of energy, in the maintenance of rolling stock and track, and also a reduction of noise. Mr. W. J. Smith, master mechanic, has given some particulars to "Electric Traction," of Chicago. From these it appears that the axles of the light-weight truck are hollow-bored, heat-treated, and oil-quenched. The weight is 170 lbs. The hollow interior is used as an auxiliary oil reservoir for roller bearing journal boxes and motor bearings. Holes drilled in the axle and fitted with a Reed oil-feed lubricate the motor bearings, similar holes being drilled so as to feed oil to the roller-bearing boxes. Braking is effected pneumatically by means of a brake drum and shoes through a system of brake link levers anchored or pivoted at two points, with a casting called a brake yoke. This brake yoke is connected to the truck frame by means of coil springs. Tension of these coil springs can be increased by tightening a bolt. This arrangement allows the truck springs over the journal box to function normally when brakes are applied, the cushioning of the brake yoke or anchor preventing any noise or chattering.

### NORTH LONDON TUBE EXTENSION.

A beginning is to be made at the end of September with the extension of the Piccadilly tube railway from Finsbury Park to Southgate, and thence for another three miles through open country to Cockfosters. As reported in our issue of September 6, the contracts for the construction of the tunnel section have been placed with Chas. Brand & Sons, of Westminster. Shafts will be sunk from ten sites between Finsbury Park and Southgate, so that the work may be carried on as rapidly as possible. The tunnel for the most part will be between 40 ft. and 50 ft. below ground level, and is to be finished within 20 months from the time of starting the work. The Company's Act authorising extension to the north also provides for the building of a new underground line from Hammersmith to Northfields, and the reconstruction of a number of tube stations in Central London. The estimated cost of these schemes is £12,000,000; about £5,335,000 is required for the northern extension. Altogether, some twenty thousand men will be employed upon the work directly and indirectly for 2½ years.

### INTERNATIONAL ROAD CONGRESS.

The sixth International Road Congress takes place at Washington from October 6 to 11. Papers on six subjects will be submitted by British members of the conference.

Sir Henry Maybury, chairman of the London and Home Counties Traffic Advisory Committee, and Mr. E. Shrapnell Smith, will deal with "Highway Transport; Correlation and Co-ordination with other Methods of Transport; Adaption to Collective and Individual Requirements."

Ald. W. G. Davie, Mr. F. L. Elliott, assistant commissioner, Scotland Yard, Mr. T. Peirson Frank, late city engineer, Liverpool, and now engineer to the London County Council, and Mr. J. S. Pool Godsell, assistant secretary to the Roads Department, Ministry of Transport, and Mr. G. L. Pepler, chief town-planning inspector, Ministry of Health, are among the British members who will deal with traffic regulations, traffic signals, design and lay-out of roads and adaptation to traffic requirements, and parking and garage of road vehicles.

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## MORE TRAMCARS FOR LONDON.

The London County Council will shortly call for tenders for the construction of another batch of tramcars required to bring the cars up to a standard of comfort exceeding that introduced by the early conversions to Pullman type. Many of the last 150 new type cars ordered a year ago are now running in South London. So far 1,600 cars have been modernised, or six out of every seven in service. As already reported in THE TRAMWAY AND RAILWAY WORLD, the number of passengers carried during the year ended March 31 last increased by 14,000,000 to 726,414,871, and the department attributes the increase to the popularity of the Pullman type of car, together with the higher speed. The cars maintain an average speed of 10 m.p.h., inclusive of stops, although the Ministry of Transport regulation limits the maximum speed to 20 m.p.h.

The reception given to improved cars during the past two years on the Metropolitan Electric Tramways and the London United Tramways has led these companies (as already noted in this journal) to order 50 and 46 cars respectively. These cars will be on double bogie trucks and will each seat 64 persons. Many of these are now under construction at the works of the Union Construction Co. at Feltham. At the same works a fleet of trolleybuses is being built for the London United Company. These two companies, together with the South Metropolitan Co., report that between January 1 and August 30 the passengers carried in their cars increased by 9,400,000, or 7 per cent.

## GLASGOW REQUEST FOR REDUCED SPREAD-OVER.

A PROPOSAL THAT WOULD COST £40,000 PER ANNUM.

The Conditions of Service Committee of Glasgow Corporation has deferred their decision on an application from the Transport Department's employees' union for an alteration in the spread-over period in order that the men may complete their eight-hour shift within a maximum of ten hours. At the suggestion of the committee a conference is to be held on the proposal between representatives of the union and the chairman and general manager of the Transport Department.

The union also asks that all work in excess of eight hours should be paid for as overtime. Under the present system the men in turn work eight hours right off and then do the eight hours in periods spread over from 10 to 12 hours. About 4,000 traffic men are affected by the application, and it is estimated that the cost of granting it would be not far short of £40,000 per annum. A large number of extra men would have to be engaged. A representative of the department has pointed out that traffic requirements vary each day, and it is very difficult to give each man the same number of hours each day. One day some men may work 7½ hours and 8½ the following day, but an attempt is made to have an average of eight hours throughout the week.

## GERMAN WIRE FOR GLASGOW.

Protests have been made at Glasgow concerning the action of the City Council in placing an order for twelve miles of trolley wire made in Germany. The tender was £44 below the price at which a duplicate order was given to a British firm.

Cr. McSkimming has asked where the country would be if every corporation sent its orders abroad because of a small difference in prices. He contends that in this case the British tender was really the cheaper. Taxation in Britain is about three times that in Germany, and wages in that country are about 28 per cent. less.

The manager of a Glasgow firm of steel merchants has admitted that a "ring" exists within the trade, but not to keep up prices. Its object is to prevent undue price-cutting. There is still keen competition within the trade.

In an interview with a "Daily Express" reporter, a member of the British firm which obtained one of the orders said: "It was our rock-bottom price. Our basic prices to-day in the non-ferrous trade generally are as low as they were in 1913, but, still, Continental firms can quote lower. Their costs of production are lower, but they score also in their transport charges. The German firm will probably be able to send their wire across here by sea cheaper than we can send ours from the Midlands by rail."

## PERSONAL.

**Mr. A. L. Lunn,** late deputy chief engineer, Manchester Corporation Electricity Department, on September 8 entered upon his appointment with the Underground Railways Group of London. The position is a new one, and the duties relate to the generation, distribution, and future development of power for the companies.

**The Great Yarmouth Vacancy.**—The following four candidates have been selected by the Transport Committee for interview for the post of manager of the Corporation Transport Department: Mr. H. A. Blackburn, manager and engineer, Keighley Corporation Tramways; Mr. M. J. Somerfield, assistant manager, Walsall Corporation Tramways and Omnibuses; Mr. W. H. Worton, engineer, Bristol Tramways and Carriage Company; Mr. C. E. Crossley, deputy engineer and manager, Chesterfield Corporation Transport Department.

**Mr. Edward Nolan,** traffic superintendent of Falkirk and District Tramways, died at Stirling on September 9. Mr. Nolan entered the service of the company about 20 years ago as a conductor, and worked his way up through various grades of service. He held responsible posts with the Scottish General Omnibus Company, with which the Falkirk and District Tramways Co. was associated, and on the amalgamation of the former with Alexanders' services, he returned to the tramways company as traffic superintendent.

## MISCELLANEOUS NEWS AND NOTES.

**Swindon Tramways Committee** intend to erect offices in Corporation-street.

**Birmingham Tramways Committee** propose to erect an omnibus depot at Perry Barr.

**Carlisle and District Motor Services** propose to extend their garage in Pater-street, Carlisle.

**Bolton Tramways Committee** is to discuss with the Transport Workers' Union a suggestion that a school should be established to train tramwaymen as omnibus drivers.

**A Liverpool Special Fare.**—On the occasion of the special service held in Thingwall Park by the Roman Catholic Church, a 2d. fare from all parts was instituted on the Liverpool tramways.

**Conscience Money.**—A postal order for 2s. has been received by the manager of Newcastle Corporation Tramways as conscience money for "a few free rides during the past few years."

**Track Removal at Rawtenstall.**—Application has been made by Rawtenstall Corporation for sanction to borrow £19,330 for the reconstruction of Burnley-road East and the removal of the tramway track.

**Conversion of a Depot.**—Burton-on-Trent Transport Department has obtained sanction to borrow £3,755 for the conversion of the tramway depot into an omnibus garage and the provision of equipment.

**Golf for Sheffield Employees.**—Captain F. W. Banning has presented a cup to encourage golf among the Sheffield Corporation transport employees. The men are fortunate in having a course at Greenhill.

**A Petrol Tank Objection.**—Stoke-on-Trent Watch Committee has refused licences for two omnibuses of the Potteries Electric Traction Co., because they consider it is not safe to have petrol tanks inside the passenger space of vehicles.

**Glasgow's Increased Traffic.**—The revenue on the Glasgow tramways, omnibuses and subway increased by £40,000 during the three months ended August, compared with the same period of last year. Tickets issued were 6½ millions more.

**Bradford Pipe Line for Petrol.**—It is proposed by Bradford Tramways Committee to lay a pipe line at an estimated cost of £95 10s. to the siding of the L.M.S. Railway in Ludnam-street, for the purpose of supplying petrol to the Ludnam-street garage.

**Extension of the Hastings Trolleybus Lines.**—Hastings Tramways Company has notified the Highways Committee of Hastings that the company wishes to carry out as promptly as possible the extension of the trolleybus system in Cambridge-gardens and Havelock-road.

**The Harrogate Conference.**—Delegates from 93 local authorities will attend the annual conference of the Municipal Tramways and Transport Association to be held at Harrogate from September 24 to 26. The full programme was given in our issue of August 30.

**Manchester Employees' Free Rides.**—In addition to the existing privilege of free riding in the tramcars when proceeding to and from their work, Manchester drivers and conductors are permitted to use the Corporation omnibuses, with the exception of express services.

**Removal of Tramways from the Centre of Rome.**—The recent substitution in the centre of Rome of motor omnibuses for the cheaper electric tramways has entailed costly road repairs. It is said, however, that the change has for the time being simplified the traffic problem.

**An Emergency Omnibus Service.**—For seventy minutes on Monday morning, the Southampton tramway service was at a standstill in consequence of a breakdown at the power station. During the interval the Corporation omnibuses were diverted to the tramway routes.

**No Five-Night Week at Bolton.**—Dissatisfaction has been expressed by the Transport Workers' Union at the refusal of Bolton Tramways Committee to establish a five-night week for depot and garage employees. A request that the Committee should receive a deputation has been refused.

**A Westminster Bridge Delay.**—For nearly half an hour on the morning of September 6 a tramcar was at a standstill on Westminster Bridge in consequence of the plough fouling an obstruction in the conduit. Following cars were stopped at a crossover and diverted to the other track.

**Fares in Edinburgh.**—The manager of Edinburgh Corporation Transport, Mr. F. A. Fitzpayne, has been asked by the Transport Sub-Committee to prepare a report with the object of considering the entire question of tramway and omnibus fares, with particular reference to routes serving new housing areas.

**The First Change-Over at Derby.**—The tramway service on Nottingham-road, Derby, will, it is understood, be discontinued early in October and an omnibus service substituted. This will be the first tramway route to be changed over, although an omnibus service has been in operation on the Uttoxeter-Burton-road for some time.

**Southampton Tramwaymen's Parade.**—On September 7 the tramwaymen of Southampton attended a service at the Central Hall, after Ald. P. V. Bowyer, J.P., chairman of the Tramways Committee, had placed a wreath on the local cenotaph. The newly-formed staff band led the singing, and the lesson was read by Ald. Bowyer.

**Leeds Tramway Power Station.**—A proposal will shortly be submitted to Leeds Corporation for the closing of the power station of the tramway department. Current will then be supplied by the Electricity Committee from the Whitehall-road station. Both the Tramway Committee and the Electricity Committee are agreeable to that course.

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**Railway Wages in Australia.**—The Victorian, New South Wales, South Australian and Tasmanian Railway Commissioners have applied to the Arbitration Courts to have conditions and wages of railwaymen under the existing award suspended on the ground of national emergency. The hearing has been fixed for September 17.

**Private Car with a Diesel Engine.**—On September 4, a private motor car, fitted with a Diesel engine, was driven from Coventry to London and back on top gear on three gallons of crude oil, costing one shilling. Its average speed for the journey of 200 miles was 20 m.p.h. The car was driven by Mr. C. B. Wardman, the owner, who was formerly with the Lea Francis Co.

**Automatic Light Signals for Traffic.**—The installation of automatic light signals for traffic at Ludgate-circus has been so successful that the city authorities propose to introduce the system at other points. "The Times" states that Cannon-street and Blackfriars Bridge will be first dealt with. It is probable that an adaptation of the idea will also be introduced along Oxford-street from Marble Arch to St. Giles-circus.

**Omnibus Passengers' Combine.**—Up to September 8 there had been no interference by the Government of Northern Ireland with the subscription omnibus promoted by people who resent a monopoly and higher fares. Two lines of railway omnibuses are affected by the proposals, namely, those operated by the County Down Railway between Belfast and Holywood and those of the Northern Counties Committee between Belfast and Ballyclare.

**Dover Tramways.**—The Dover Tramways Committee has decided to take no action on a suggestion by Councillor Norman that they should try trolleybuses or petrol omnibuses in place of the tramways on the Folkestone-road, a large part of which is to be remade. The chairman, Ald. R. J. Barwick, considered they should defer the proposal until the loans expired in six years. The tramways, he said, had turned the corner and were making profits.

**Omnibuses Substituted at Barnsley.**—The tramway services of the Yorkshire Traction Co. between Barnsley and Worsbro' Bridge-Worsbro' Dale, and from Barnsley to Smithies, have been withdrawn, and omnibus services substituted. The last tramcar was driven by Mr. Arthur Wood, traffic superintendent, who also drove one of the first cars when they were introduced in 1902. A last special car was driven by Mr. G. W. Robinson, general manager.

**Liverpool Railway Centenary.**—The American Ambassador will, on Saturday, open at Liverpool a week's centenary celebration of the opening of the Liverpool and Manchester railway. There will be a pageant of transport with 3,000 performers on the Wavertree Recreation Ground, and a railway exhibition will be open daily at St. George's Hall. It will consist of model miniature railways and historical matter connected with the Liverpool and Manchester railway.

**Municipalisation Proposal at Llanelly.**—A special meeting of Llanelly Corporation is to be held to consider a proposal that the Council shall acquire the undertaking of Llanelly Electric Supply and Traction Company. The company recently obtained powers to convert the tramways into a trolleybus undertaking, and to extend the routes. A deputation from the Corporation and their expert adviser have met representatives of the company, and arrived at a tentative agreement.

**Charing Cross Bridge.**—About 50 schemes have been received for the Charing Cross Bridge project. The plans are being dealt with by the Advisory Committee, whose duty it is to prepare an agreed scheme for presentation to the London County Council when it reassembles on October 21. The Committee, of which Sir Leslie Scott, K.C., is chairman, announced some time ago that they would consider any suggestions made by Londoners, not only by experts, but by the "man in the street."

**Proposed Brighton Traffic Merger.**—Good progress is stated to have been made recently in connection with the traffic merger scheme at Brighton. Hove General Purposes Committee has approved the proposals. The scheme provides for the amalgamation of the local omnibus services of Tillings, Ltd., and the Brighton Corporation Tramways. A new company will be formed, the directors of which will be representatives of the Brighton and Hove Corporations and Messrs. Tillings. Under the scheme Brighton will surrender its tramways and Messrs. Tillings their omnibuses, and Hove will contribute £100,000.

**Proposed Change-over at Kirkcaldy.**—The Town Council of Kirkcaldy has decided to discontinue the tramways, and has asked the Transport and Electricity Committee to recommend the best method of replacing the system, wholly or partially, by another system of transport. The report is to be prepared for submission to the Town Council in December. The tramways comprise 8½ miles of track, and the car mileage for the past year amounted to 480,895. Passengers numbered 4,437,895. The total revenue was £24,347, working expenses, £27,408. After paying interest and sinking fund charges, there was a net deficit of £8,631.

**New Omnibus Service from Bury.**—On September 6, Bury Corporation instituted a motor omnibus service from Bury to the Stopes terminus at Radcliffe. The tramcars on that route are now used only during the periods of the workpeople's traffic, as is also the case on the Black-lane-Whitefield route. It is locally suggested that an increase in the number of double-deck omnibuses will obviate the need for using the cars. To a complaint that the omnibus services entail a reduction in the amount of electricity used, reply has been made that the business can only be regained by introducing trolleybuses. This course cannot be proposed until Bury Tramways Committee and Radcliffe Urban Council arrange a new agreement.

**Omnibus for Road and Rail.**—Karrier Motors, Ltd., are co-operating with the L.M.S. Rly. Co., in producing an omnibus to run both on the railway and on the road. Three vehicles have been constructed, and for a considerable time experiments have been made in the Huddersfield district. The engine when in use on the railway is capable, the "Yorkshire Post" states, of driving the vehicle at a speed of 60 m.p.h.

**Trolleybuses in the Thames Valley.**—The London United Tramways Co. hope to have their experimental trolleybus service in operation by the end of 1930, or early next year. Negotiations are in progress with the local authorities as to the provision of turning places. The system will first be installed between Tolworth, Surbiton, Kingston, Teddington, and Twickenham. The sections between Kingston and Wimbledon, Richmond Park, and the Dittons will be converted later.

**Bradford Tramway Position.**—Two meetings have been held this week of the sub-committee of Bradford Tramways Committee appointed to consider suggestions made by Mr. R. H. Wilkinson, general manager, for improving the financial position of the undertaking, and another meeting will be held on September 15. With a view to assisting the department, the employees have placed their views before Mr. J. H. Palin, M.P., and Mr. W. Leach, M.P., two Labour members of the sub-committee.

**Dunlop Rubber Co. and Rubber Prices.**—The Dunlop Rubber Co., Ltd., which owns extensive plantations in Malaya, has issued a circular to its shareholders stating that the cost of production on the company's plantation was reduced last month to less than 4d. per lb., including depreciation. When the new and improved areas come into production costs are expected to fall below 3d. a lb., and with such low costs, which are below the present price of 4½d. a lb., Sir Eric Geddes considers that the company can view the situation without alarm.

**New Omnibuses for Glasgow.**—It is expected that Glasgow Transport Committee will shortly be asked to approve a scheme for the erection of a garage for 200 double-deck omnibuses. It is estimated that the outlay will approximate that of a similar garage in Victoria-road, which, with extensions, cost £65,000. The special sub-committee has been considering the matter, and it is anticipated that a site will be found in the neighbourhood of Anniesland Cross. Not long ago a garage was opened in Victoria-road, but it is inadequate in view of the 100 additional omnibuses which the Corporation recently purchased. Before the end of the year, the Corporation may have between 300 and 400 omnibuses.

## CONTRACTS.

**Forest City Electric Co., Ltd.**, of Manchester, have a contract to supply traffic light signals to Stretford Council, at £92.

**Leyland Motors, Ltd.**, are to supply 10 complete "Titan" omnibuses and 20 chassis to Wigan Town Council at £35,480.

**Sheffield City Council** has accepted the tender of Leyland Motors, Ltd., for five double-deck motor omnibuses and five single-deck motor omnibuses.

**Salford Town Council** has placed an order with John I. Thornycroft & Co., Ltd., for one 6-ton Thornycroft commercial vehicle with tipping body at £1,000.

**The Southern Railway** has placed contracts with Siemen's Electric Lamps & Supplies, Ltd., and the Metropolitan-Vickers Electrical Co., Ltd., for 12 months' supply of electric lamps.

**The British General Electric Co.**, in competition with eighteen manufacturers in various countries, have been awarded the following contracts by Johannesburg Council: 1,000 10-amp. and 800 20-amp. electricity meters, made by Chamberlain & Hookham, an associated company.

**Johannesburg Council** has placed contracts as follows: Wade and Dorman, 800 tons of grooved tramway rails £15,000, 2,500 pairs of grooved rail fishplates and two tons of fishbolts; H. Alers Hankey, 2,500 tiebars. All the material is to be of British manufacture.

## FINANCIAL.

**British Aluminium Co., Ltd.**—An interim dividend is announced of 4 per cent., less tax, on ordinary shares. A year ago the dividend was the same.

**The General Electric Co., Ltd.**—The directors of the General Electric Co., Ltd., at a meeting on Thursday, decided to make a new issue of debenture stock with the object of redeeming the existing debenture stock.

**Ayr Tramways Deficit.**—The revenue of Ayr Corporation Tramways for the year ended May 15, 1930, was £29,960, and the working expenses £24,326. After payment of interest, sinking fund, etc., there was a deficit of £4,232.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended September 10 amounted to £81,579, a decrease of £1,395 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to September 10 (23 2-7 weeks), the total receipts were £1,921,763, a decrease of £14,982.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended August 23 gave total receipts of £418,336, or £2,368 more than in the corresponding week of last year. The aggregate receipts for twenty-one weeks amounted to £8,869,976, an increase of £119,802 over the corresponding period of last year.

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**Stewarts & Lloyds, Ltd.**—Interim dividends have been declared for the half-year ended June 30, 1930, at the rate of six per cent. per annum on the preference shares and at ten per cent. per annum on the preferred ordinary shares.

**Improved Result at Newport.**—For the past financial year the revenue of Newport Corporation Tramways was £90,246, as compared with £89,332 for the preceding year. The working expenses totalled £65,865 (£67,180 in 1928-29), leaving a gross profit of £24,381 (£22,152). The net profit was £4,216, as against a deficiency of £1,583 for the preceding year. The net receipts per car mile were 17.74d.

**Preston Corporation Transport.**—Traffic receipts on the Preston Tramways increased by £937 during the last financial year, and the net surplus was £3,574, which raised the credit balance to £11,463. The outstanding debt was £41,905, and there are only three more years to run before the first cost is wholly liquidated. The omnibuses had a net surplus of £1,352. The outstanding debt on the omnibuses is £13,070, and provision is made for the liquidation of the debt within six years from the date of purchase.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | Aug. 19 | 517 | 512 | — 5 | 20 | 11,600 | — 222 |
| „ Motor Buses ... | „ 19 | 210 | 277 | + 67 | 20 | 5,870 | + 994 |
| „ Total ... ... | „ 19 | 727 | 789 | + 62 | 20 | 17,470 | + 772 |
| Aberdeen Corp. ... | Sept. 3 | 5,486 | 5,595 | + 109 | 13½ | 79,012 | + 940 |
| Ashton-u-Lyne Corp. | „ 6 | 922 | 838 | — 84 | 23 | 19,682 | — 1,501 |
| „ Motor Buses ... | „ 6 | 454 | 505 | + 51 | 23 | 11,527 | + 96 |
| „ Trolley Buses ... | „ 6 | 245 | 229 | — 16 | 23 | 5,987 | — 397 |
| „ Total ... ... | „ 6 | 1,621 | 1,572 | — 49 | 23 | 37,196 | — 1,802 |
| Ayr Corporation ... | „ 6 | 580 | 551 | — 29 | 16 | 11,197 | — 892 |
| Barrow Corporation... | „ 6 | 641 | 605 | — 36 | 23 | 13,662 | — 1,063 |
| „ Motor Buses ... | „ 6 | 475 | 453 | — 22 | 23 | 9,831 | + 752 |
| „ Total ... ... | „ 6 | 1,116 | 1,058 | — 58 | 23 | 23,493 | — 311 |
| Belfast City ... ... | „ 5 | 11,472 | 11,688 | + 216 | 22½ | 259,747 | + 8,250 |
| „ Motor Buses ... | „ 5 | 1,057 | 1,282 | + 225 | 22½ | 29,363 | + 6,173 |
| „ Total ... ... | „ 5 | 12,529 | 12,970 | + 441 | 22½ | 289,110 | + 14,423 |
| Birkenhead Corp. ... | „ 7 | 1,733 | 1,469 | — 264 | 23 | 35,757 | — 3,808 |
| „ Motor Buses ... | „ 7 | 3,580 | 4,020 | + 440 | 23 | 86,681 | — 1,957 |
| „ Total ... ... | „ 7 | 5,313 | 5,489 | + 176 | 23 | 122,438 | — 5,765 |
| Birmingham Corp. ... | „ 2 | 27,101 | 25,412 | — 1,689 | 22 | 578,408 | — 16,789 |
| „ Motor Buses ... | „ 2 | 13,359 | 15,926 | + 2,567 | 22 | 337,499 | + 55,496 |
| „ Trolley Buses ... | „ 2 | 552 | 507 | — 45 | 22 | 11,974 | — 97 |
| „ Total ... ... | „ 2 | 41,012 | 41,845 | + 833 | 22 | 927,881 | + 38,610 |
| Blackburn Corp. ... | Aug. 27 | 1,915 | 1,808 | — 107 | 21⅞ | 39,201 | — 3,388 |
| „ Motor Buses ... | „ 27 | Nil | 299 | + 299 | 21⅞ | 6,857 | + 6,857 |
| „ Total ... ... | „ 27 | 1,915 | 2,107 | + 192 | 21⅞ | 46,058 | + 3,469 |
| Bradford Corporation | Sept. 6 | 14,820 | 14,153 | — 667 | 23 | 325,877 | — 14,212 |
| Brighton Corporation | „ 7 | 3,368 | 3,314 | — 54 | 22⅞ | 67,813 | + 2,187 |
| Burnley Corporation... | „ 6 | 3,412 | 2,787 | — 625 | — | ... | — |
| „ Motor Buses ... | „ 6 | 645 | 655 | + 10 | — | ... | — |
| „ Total ... ... | „ 6 | 4,057 | 3,442 | — 615 | ... | | — |
| Burton-on-Trent Corp. | „ 7 | 838 | 850 | + 12 | 23 | 19,436 | + 632 |
| Bury Corporation ... | „ 7 | 2,116 | 1,731 | — 385 | 22⅞ | 42,713 | — 4,234 |
| „ Motor Buses ... | „ 7 | 599 | 1,422 | + 823 | 22⅞ | 24,651 | + 14,525 |
| „ Total ... ... | „ 7 | 2,715 | 3,153 | + 438 | 22⅞ | 67,364 | + 10,291 |
| Cardiff Corporation ... | Aug. 2 | 7,502 | 7,891 | + 389 | 17½ | 138,887 | + 2,978 |
| Chatham and District | Sept. 4 | 1,451 | 1,372 | — 79 | 35 | 40,998 | + 563 |
| Chester Corporation ... | Aug. 31 | 435 | Nil | — 435 | 22 | Nil | — 9,869 |
| „ Motor Buses ... | „ 31 | Nil | 689 | + 689 | 22 | 14,692 | + 14,692 |
| „ Total ... ... | „ 31 | 435 | 689 | + 254 | 22 | 14,692 | + 4,823 |
| Chesterfield Corp. ... | Sept. 8 | 2,234 | 2,212 | — 22 | 23 | 44,128 | + 1,077 |
| Colchester Corp. ... | „ 11 | 572 | 612 | + 40 | 24 | 14,783 | + 1,601 |
| Colne Corporation ... | „ 10 | 911 | 788 | — 123 | 24 | 16,668 | — 333 |
| Coventry Corporation | „ 7 | 2,110 | 1,782 | — 328 | 23 | 45,774 | — 3,183 |
| „ Motor Buses ... | „ 7 | 1,595 | 1,622 | + 27 | 23 | 41,383 | + 5,299 |
| „ Total ... ... | „ 7 | 3,705 | 3,404 | — 301 | 23 | 87,157 | + 2,116 |
| Darlington Corp. ... | „ 6 | 1,031 | 1,071 | + 40 | 22⅞ | 24,256 | + 2,062 |
| Derby Corporation ... | „ 6 | 2,696 | 2,438 | — 258 | 23 | 56,217 | — 1,596 |
| „ Motor Buses ... | „ 6 | 780 | 925 | + 145 | 23 | 20,948 | + 4,608 |
| „ Total ... ... | „ 6 | 3,476 | 3,363 | — 113 | 23 | 77,165 | + 3,012 |
| Dover Corporation ... | „ 6 | 524 | 528 | + 4 | 23 | 10,375 | + 345 |
| Dundee Corporation... | Aug. 26 | 2,707 | 2,676 | — 31 | 14⅞ | 37,847 | — 1,119 |
| „ Motor Buses ... | „ 26 | 904 | 1,270 | + 366 | 14⅞ | 16,271 | + 3,982 |
| „ Total ... ... | „ 26 | 3,611 | 3,946 | + 335 | 14⅞ | 54,118 | + 2,863 |
| East Ham Corp. ... | Sept. 6 | 2,351 | 2,285 | — 66 | 22⅞ | 52,357 | + 691 |
| Edinburgh Corp. ... | Aug. 30 | 13,809 | 14,373 | + 564 | 15⅞ | 235,376 | + 5,979 |
| „ Motor Buses ... | „ 30 | 3,355 | 3,717 | + 362 | 15⅞ | 59,509 | + 4,923 |
| „ Total ... ... | „ 30 | 17,164 | 18,090 | + 926 | 15⅞ | 294,885 | + 10,902 |
| Exeter Corporation ... | Sept. 10 | 944 | 789 | — 155 | 24 | 19,519 | — 1,433 |
| „ Motor Buses ... | „ 10 | 184 | 411 | + 227 | 24 | 7,500 | + 4,158 |
| „ Total .. ... | „ 10 | 1,128 | 1,200 | + 72 | 24 | 27,019 | + 2,725 |
| Glasgow Corporation... | Aug. 30 | 43,387 | 44,042 | + 655 | 13 | 553,038 | + 2,073 |
| „ Motor Buses ... | „ 30 | 5,654 | 8,859 | + 3,205 | 13 | 104,893 | + 40,092 |
| „ Total ... ... | „ 30 | 49,041 | 52,901 | + 3,860 | 13 | 657,934 | + 42,165 |
| Gloucester Corp. ... | Sept. 3 | 596 | 774 | + 178 | 22⅞ | 16,016 | + 3,470 |
| Grimsby Corporation | „ 6 | 1,654 | 1,726 | + 72 | 23 | 36,947 | + 3,992 |
| Halifax Corporation | „ 2 | 4,647 | 5,329 | + 681 | 22½ | 115,334 | + 13,349 |
| Huddersfield Corp. ... | „ 6 | 6,667 | 6,559 | — 108 | 23 | 146,559 | — 1,637 |
| Hull Corporation ... | „ 6 | 5,891 | 5,592 | — 299 | 23 | 130,061 | — 2,936 |
| „ Motor Buses ... | „ 6 | 1,375 | 1,697 | + 322 | 23 | 35,732 | + 5,235 |
| „ Total ... ... | „ 6 | 7,266 | 7,289 | + 23 | 23 | 165,793 | + 2,299 |
| Ilford Corporation ... | „ 6 | 1,482 | 1,482 | Nil | 22⅞ | 34,426 | + 627 |
| Ipswich Corp. Trol.Bus | „ 6 | 1,375 | 1,391 | + 16 | 22⅞ | 31,094 | + 1,665 |
| Isle of Thanet ... | „ 3 | 2,246 | 2,009 | — 237 | 35½ | 31,475 | — 3,465 |
| Kilmarnock Corp. ... | „ 6 | 475 | 495 | + 20 | 16⅞ | 8,002 | + 324 |
| Lancashire Un. ... | Aug. 31 | 2,207 | 2,062 | — 145 | 34⅞ | 74,100 | — 3,896 |
| „ Motor Buses ... | „ 31 | 6,009 | 5,432 | — 577 | 34⅞ | 171,740 | + 23,781 |
| Leeds Corporation ... | Sept. 6 | 20,184 | 19,813 | — 371 | 22⅞ | 455,415 | + 9,498 |
| Leicester Corp. ... | „ 6 | 8,647 | 8,334 | — 313 | 23 | 190,297 | + 624 |
| Lincoln Corp. ... | Aug. 24 | 969 | 961 | — 8 | 21 | 19,724 | + 70 |
| Liverpool Corp. ... | Sept. 6 | 30,496 | 30,580 | + 84 | 22⅞ | 687,231 | + 923 |
| London County Coun. | „ 10 | 82,974 | 81,579 | — 1,395 | 23½ | 1,921,763 | — 14,952 |
| Luton Corporation ... | „ 3 | 458 | 447 | — 11 | 22½ | 9,604 | + 295 |
| Maidstone Corp. ... | „ 4 | 165 | Nil | — 165 | 22½ | Nil | — 5,138 |
| „ Motor Buses ... | „ 4 | 349 | 289 | — 60 | 22½ | 6,293 | — 350 |
| „ Trolley Buses ... | „ 4 | 306 | 579 | + 273 | 22½ | 13,856 | + 6,919 |
| „ Total ... ... | „ 4 | 820 | 868 | + 48 | 22½ | 20,149 | + 1,431 |
| Manchester Corp. ... | Aug. 30 | 34,806 | 31,345 | — 3,461 | 22 | 700,552 | — 62,145 |
| „ Motor Buses ... | „ 30 | 4,894 | 8,731 | + 3,837 | 22 | 188,501 | + 83,528 |
| „ Total ... ... | „ 30 | 39,700 | 40,076 | + 376 | 22 | 889,053 | + 21,383 |
| Middlesbrough Corp. | Sept. 2 | 1,177 | 929 | — 248 | 22½ | 23,126 | — 2,158 |
| „ Motor Buses ... | „ 2 | 611 | 630 | + 19 | 22½ | 12,784 | + 1,234 |
| „ Total ... ... | „ 2 | 1,788 | 1,559 | — 229 | 22½ | 35,910 | — 924 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty.Corp. | Sept. 6 | 10,219 | 8,340 | — 1,879 | 22⅞ | 198,263 | — 31,410 |
| „ Motor Buses ... | „ 6 | 2,092 | 3,538 | + 1,446 | 22⅞ | 71,594 | + 24,316 |
| „ Total ... ... | „ 6 | 12,311 | 11,878 | — 433 | 22⅞ | 269,857 | — 7,094 |
| Newport Corporation | Aug. 30 | 1,673 | 1,062 | — 611 | 22 | 34,099 | — 2,530 |
| „ Motor Buses ... | „ 30 | 783 | 1,331 | + 548 | 22 | 18,793 | + 2,176 |
| „ Total ... ... | „ 30 | 2,456 | 2,393 | — 63 | 22 | 52,892 | — 354 |
| Northampton Corp. ... | Sept. 5 | 1,144 | 881 | — 263 | 22½ | 24,525 | — 704 |
| „ Motor Buses ... | „ 5 | 737 | 973 | + 236 | 22½ | 16,734 | + 1,682 |
| „ Total ... ... | „ 5 | 1,881 | 1,854 | — 27 | 22½ | 41,259 | + 978 |
| Nottingham Corp ... | „ 4 | 6,648 | 5,518 | — 1,130 | 22⅞ | 129,350 | — 19,700 |
| „ Motor Buses ... | „ 4 | 2,320 | 3,387 | + 1,067 | 22⅞ | 74,793 | + 23,886 |
| „ Trolley Buses ... | „ 4 | 581 | 1,191 | + 610 | 22⅞ | 26,951 | + 13,759 |
| „ Total ... ... | „ 4 | 9,549 | 10,096 | + 547 | 22⅞ | 231,094 | + 17,945 |
| Oldham Corporation | „ 6 | 2,769 | 2,738 | — 31 | 24 | 79,859 | — 5,001 |
| „ Motor Buses ... | „ 6 | 1,746 | 1,813 | + 67 | 24 | 47,831 | — 1,087 |
| „ Total ... ... | „ 6 | 4,515 | 4,551 | + 36 | 24 | 127,690 | — 6,088 |
| Plymouth Corp. ... | „ 6 | 4,365 | 4,073 | — 292 | 22⅞ | 85,351 | — 3,597 |
| „ Motor Buses ... | „ 6 | 2,111 | 2,684 | + 573 | 22⅞ | 56,567 | + 12,063 |
| „ Total ... ... | „ 6 | 6,476 | 6,757 | + 281 | 22⅞ | 141,918 | + 8,466 |
| Portsmouth Corp. ... | „ 6 | 6,821 | 5,931 | — 890 | 23 | 104,089 | — 9,003 |
| „ Motor Buses ... | „ 6 | 2,828 | 4,306 | + 1,478 | 23 | 80,961 | + 31,583 |
| „ Total ... ... | „ 6 | 9,649 | 10,237 | + 588 | 23 | 185,050 | + 22,580 |
| Preston Corporation... | „ 3 | 1,827 | 1,751 | — 76 | 22⅞ | 37,344 | — 1,884 |
| „ Motor Buses ... | „ 3 | 516 | 541 | + 25 | 22⅞ | 11,618 | + 691 |
| „ Total ... ... | „ 3 | 2,343 | 2,292 | — 51 | 22⅞ | 48,962 | — 1,193 |
| Rawtenstall Corp. ... | „ 7 | 864 | 641 | — 223 | 22⅞ | 14,877 | — 4,508 |
| „ Motor Buses ... | „ 7 | 540 | 683 | + 143 | 22⅞ | 16,080 | + 4,042 |
| „ Total ... ... | „ 7 | 1,404 | 1,324 | + 80 | 22⅞ | 30,957 | — 466 |
| Reading Corporation | „ 4 | 1,676 | 1,511 | — 165 | 23 | 32,610 | — 1,560 |
| „ Motor Buses ... | „ 4 | 988 | 1,012 | + 24 | 23 | 22,891 | + 2,078 |
| „ Total ... ... | „ 4 | 2,664 | 2,523 | — 141 | 23 | 56,501 | + 518 |
| Rochdale Corp. ... | „ 6 | 2,960 | 2,860 | — 100 | ... | 63,071 | — 4,681 |
| „ Motor Buses ... | „ 6 | 1,595 | 1,559 | — 36 | ... | 35,703 | + 206 |
| „ Total ... ... | „ 6 | 4,555 | 4,419 | — 136 | .. | 98,774 | — 4,475 |
| Rotherham Corp. ... | „ 8 | 2,684 | 2,734 | + 50 | 23 | 63,201 | + 2,025 |
| Salford Corporation ... | „ 7 | 12,234 | 11,375 | — 859 | 22⅞ | 255,764 | + 498 |
| Sheffield Corp. ... | „ 6 | 21,287 | 19,870 | — 1,417 | 22½ | 467,740 | — 13,372 |
| Southampton Corp. ... | „ 3 | 3,760 | 3,752 | — 8 | 23 | 79,287 | + 1,755 |
| „ Motor Buses ... | „ 3 | 887 | 892 | + 5 | 23 | 19,763 | + 2,453 |
| „ Total ... ... | „ 3 | 4,647 | 4,644 | — 3 | 23 | 99,050 | + 4,208 |
| Southend-on-Sea Corp. | „ 10 | 2,832 | 2,679 | — 153 | 23⅞ | 55,972 | — 3,169 |
| „ Trolley Buses ... | „ 10 | 367 | 403 | + 36 | 23⅞ | 8,086 | + 2,869 |
| „ Total ... ... | „ 10 | 3,199 | 3,082 | — 117 | 23⅞ | 64,058 | — 300 |
| Southport Corp. ... | „ 6 | 1,644 | 1,526 | — 118 | 22⅞ | 32,309 | — 683 |
| „ Motor Buses ... | „ 6 | 506 | 504 | — 2 | 22⅞ | 10,517 | + 968 |
| „ Total ... ... | „ 6 | 2,150 | 2,030 | + 120 | 22⅞ | 42,826 | + 285 |
| St. Helens Corp. ... | „ 2 | 1,993 | 2,090 | + 97 | 22½ | 45,449 | + 2,595 |
| Sunderland Corp. ... | „ 9 | 2,701 | 2,245 | — 456 | 23 | 59,179 | + 1,224 |
| „ Motor Buses ... | „ 9 | 331 | 752 | + 421 | 23 | 13,307 | + 9,301 |
| „ Total ... ... | „ 9 | 3,032 | 2,997 | — 35 | 23 | 72,486 | + 9,525 |
| Swindon Corp. ... | „ 3 | 928 | 1,102 | + 174 | 22⅞ | 22,347 | + 4,697 |
| Wallasey Corp. ... | „ 6 | 1,430 | 1,296 | — 134 | 22⅞ | 29,418 | — 2,540 |
| „ Motor Buses ... | „ 6 | 2,399 | 2,715 | + 316 | 22⅞ | 56,770 | + 5,350 |
| „ Total ... ... | „ 6 | 3,829 | 4,011 | + 182 | 22⅞ | 86,188 | + 8,810 |
| Walsall Corporation... | Aug. 31 | 3,585 | 3,534 | — 51 | 22 | 76,092 | + 1,170 |
| Walthamstow Corp. ... | Sept. 6 | 2,611 | 2,533 | — 78 | 22⅞ | 56,752 | — 194 |
| Warrington Corp. ... | „ 4 | 901 | 878 | — 23 | 23 | 20,199 | + 19 |
| „ Motor Buses ... | „ 4 | 466 | 491 | + 25 | 23 | 15,441 | + 1,292 |
| „ Total ... ... | „ 4 | 1,367 | 1,369 | + 2 | 23 | 35,640 | + 1,311 |
| West Ham Corp. ... | „ 4 | 6,194 | 5,834 | — 360 | 22⅞ | 135,889 | + 1,154 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | Aug. 31 | 2,792 | 2,477 | — 315 | 22 | 54,171 | — 8,108 |
| „ Trolley Buses ... | „ 31 | 3,340 | 3,347 | + 7 | 22 | 76,970 | + 3,771 |
| „ Total ... ... | „ 31 | 6,132 | 5,824 | — 308 | 22 | 131,141 | — 4,337 |
| York Corporation ... | Sept. 3 | 1,232 | 1,227 | — 5 | 23 | 24,182 | — 55 |
| „ Motor Buses ... | „ 3 | 465 | 546 | + 81 | 23 | 11,613 | + 2,851 |
| „ Trolley Buses ... | „ 3 | 62 | Nil | — 62 | 23 | Nil | — 1,187 |
| „ Total ... ... | „ 3 | 1,759 | 1,773 | + 14 | 23 | 35,795 | + 1,609 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or M | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Sept. 9 | £88,425 | £77,937 | 36 w | £2,959,320 | — £144,991 |
| Brazilian Traction $ | July | 4,335,895 | 4,081,018 | 7 m | 28,367,377 | — 5,543 |
| British Columbia $ | July | 1,156,720 | 1,196,239 | 1 m | 1,196,239 | + 39,519 |
| Buenos Aires Lacroze | Sept. 7 | 12,206 | 10,913 | 10 w | 105,657 | — 9,615 |
| Burma E. Sup. Co. Rs. | July | 64,649 | 66,444 | 12 m | 776,289 | — 17,071 |
| Calcutta ... Rs. | Sept. 6 | 125,883 | 107,952 | 35½ w | 3,973,879 | — 561,267 |
| Cape Town ... ... | July | 27,779 | 24,953 | ... | ... | .. |
| Carthagena & Herrerias | Aug. | 1,169 | 505 | 8 m | 6,855 | — 1,235 |
| Durban Corporation | July | 29,110 | 27,049 | 12 m | 288,972 | — 3,643 |
| East India ... ... | Aug. | 4,152 | 3,948 | 1 m | 3,948 | — 204 |
| Kalgoorlie ... ... | May | 1,747 | 1,815 | 5 m | 8,134 | — 68 |
| Madras (2 weeks) Rs. | Aug. 31 | 45,618 | 47,245 | 34 w | 741,958 | + 37,253 |
| Para ... ... | July | 15,044 | 14,816 | 8 m | 118,623 | + 521 |
| Port Elizabeth ... | July | 7,503 | 7,045 | ... | ... | ... |
| Rangoon ... Rs. | Aug. | 123,550 | 146,320 | 8 m | 1,197,255 | + 242,264 |
| Shanghai ... $ | Aug. | 335,172 | 386,112 | 7 m | 2,679,699 | + 49,478 |
| Singapore ... ...$ | Aug. | 130,000 | 142,000 | 11 m | 1,510,000 | + 165,000 |
| Winnipeg ... ...$ | July | 497,935 | 452,212 | 7 m | 3,725,716 | — 112,297 |

## RAILWAY RECEIPTS.

| 36th Week ended Sept. 7th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 286,000 | — 18,000 | 332,000 | — 16,000 | 618,000 | — 34,000 | — 971,000 |
| L.M.S.R. | 603,000 | — 43,000 | 741,000 | — 110,000 | 1,344,000 | — 153,000 | -3,104,000 |
| L.N.E.R. | 414,000 | — 13,000 | 598,000 | — 85,000 | 1,012,000 | — 98,000 | -1,994,000 |
| S.R. | 382,000 | — 25,000 | 89,000 | — 8,000 | 471,000 | — 33,000 | — 364,000 |
| Totals | 1,685,000 | — 99,000 | 1,760,000 | — 219,000 | 3,445,000 | — 318,000 | -6,433,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Sept. 6 | 304,000 | 309,200 | + 5,200 | 10,835,900 | + 619,300 |
| Lond. & Sub. Group | „ 6 | 45,700 | 45,900 | + 200 | 1,590,900 | + 100,500 |
| Metropolitan Railway | „ 6 | 36,400 | 35,800 | — 600 | 1,317,800 | + 20,800 |
| Liverpool Overhead | „ 7 | 1,813 | 1,656 | — 157 | 57,083 | — 4,031 |
| Mersey Railway ... | „ 6 | 4,450 | 4,482 | + 32 | 163,357 | + 3,970 |

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THE Tramway & Railway World
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# THE TROLLEYBUS IN NORTH AMERICA.

By E. Geoffrey Cullwick, M.A. (Cantab.)
*Assistant Professor of Electrical Engineering in the University of British Columbia.*

Judging by the increased use and greater success of the trolleybus in the U.S.A. during the last two years, it seems clear that this modern form of street transportation has finally achieved a permanent place in American practice. It may be of interest, before discussing the modern vehicle, to give a brief sketch of the development of the "trackless trolley" in North America.

The history of the American trolleybus may be roughly divided into four stages. The first, from 1903 until after the War, was the stage of isolated experiments. Following the appearance of the "railless electric car" on the Continent of Europe in the early years of this century, an experimental line was successfully operated at Scranton, Pennsylvania, in 1903, by the American Trolley Bus Company. Although other lines were planned on the same system, none of them appear to have been put into service. In 1910, however, we find a route in operation in Los Angeles, one and a half miles long, which was the only trolleybus system in use in the U.S.A. at that time. In 1913 a single vehicle was in use for a short time in Merrill, Wisconsin, and this trolleybus was afterwards sold to the West End Street Railway, Boston, where it was used for a few months in 1916.

A Trolleybus at New Orleans.

After the War it was found that the cost of installing and operating street railways had considerably increased, so that from 1920 to 1924 we find much interest taken in the possibilities of the trolleybus. A number of systems were put into operation in the U.S.A. and Canada, but the trolleybuses did not prove popular with the public, and the high cost of operating them outweighed the advantage of low capital outlay. Their failure was entirely due to the improvised nature of the trolleybuses; heavy street-car equipment was fitted to clumsy solid-tyred trucks, the attitude of the manufacturers apparently being that the new system was not likely to be universally adopted and so did not warrant much thought or expense in its design. At the present time four only of the systems put into use during this period are still operating—in Baltimore, Md.; Philadelphia, Pa.; Rochester, N.Y.; and Cohoes, N.Y. Those installed in Staten Island, N.Y., Toronto and Windsor, Canada, Minneapolis, Minn., and Petersburg, Va., have all been abandoned.

The third stage is, therefore, one of decline; the failure of these systems brought the whole principle of trolleybus operation into disfavour. The essential

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reason for the failure—poor engineering—was overlooked, and a wall of prejudice arose. It is interesting to note that in 1924 a committee of the American Electric Railway Association visited England and studied the trolleybus systems there. At that time the vehicles in use in England were of the old type with solid tyres and heavy equipment. They had been put into use chiefly on account of the high cost of track upkeep with tramways, and did not show any great superiority over the trolleybuses in use in the U.S.A. The committee reported, therefore, that they considered the trolleybus to have too narrow a sphere of use to justify its further development. An editorial in the "Electric Railway Journal" in 1927 summed up the situation with the words: "Whatever the ultimate fate of the trackless trolley may be abroad, it certainly appears to have passed the crest of its popularity in this country."

### Sound Engineering Development.

In the meantime, however, the petrol-driven omnibus has been making great strides in increased comfort and popularity. Its smooth-riding qualities, due to pneumatic tyres and improved chassis and body construction, were equally available to the trolleybus, and on September 9, 1928, a fleet of ten pneumatic-tyred trolleybuses started operation in Salt Lake City. These were constructed by the Versare Coach Corporation, and were 43-seat, 6-wheeled single-deck vehicles, weighing about 16,000 lbs. Two 50-H.P. Westinghouse series motors gave an acceleration of from 3 to 3.5 M.P.H.P.S., and a free running speed of 30 M.P.H.

The success of this fleet marks the beginning of the fourth and present stage, that of sound engineering development and increasing popularity. It is stated that traffic on the route (about 4.5 miles) increased permanently by 30 per cent. after conversion from street-cars, and in rush hours the trolleybuses carry from 70 to 80 passengers. The management of the undertaking have issued the following interesting facts:—

A. Comparative operating costs—
   (1) Trolleybuses .. 100 per cent.
   (2) Street cars .. 125 per cent.
   (3) Motor omnibuses 159 per cent.

B. Energy consumption—
   (1) Trolleybuses .. 2.2 K.W.H. per bus-mile (winter months)
   (2) Street cars .. 4.3 K.W.H. per car-mile

The seating capacity of the street cars is approximately the same as that of the trolleybuses.

Installations of up-to-date trolleybuses have since been made in New Orleans, Manila (Philippine Islands), Knoxville (Tenn.), Detroit, Cincinnati, and Chicago. The latter city will shortly have the largest trolleybus installation in the country: forty-one trolleybuses will serve five routes with a total mileage of seventeen. The first route was opened on April 17 of this year.

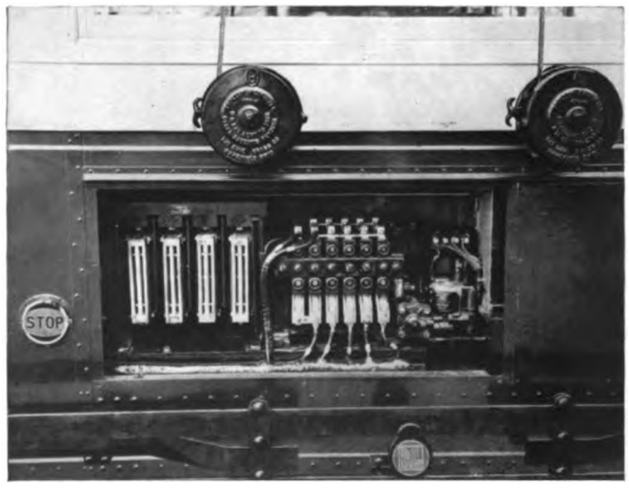
The modern American trolleybus appears to be becoming standardised as a four-wheel, single-deck, forty-seater. The six-wheeled principle has been hampered in its development in the U.S.A. on account of important features being patented by the British War Office. The double-deck has never been popular on this continent, apparently for no very convincing reasons. It is true that with very cold winters the heating problem is more acute with an upper deck, and the height of the existing overhead fixtures tends to prevent any departure from standard practice.

### A New Orleans Trolleybus.

The trolleybus shown in the first illustration is one recently put into operation in New Orleans. It

Operator's Cabin of the A.C.F. Trolleybus.

was built by the American Car and Foundry Motors Company (A.C.F.), and is fitted with General Electric electrical equipment. The coach weighs 19,000 lbs. and has a nominal seating capacity of forty. The tyres are 38 in. by 9 in., duals being fitted on the rear




Rear View showing Contactor Group.

wheels. The entrance door is situated just behind the front wheels, while a treadle-operated exit door is provided in the rear.

The two G.E. motors are series-wound and rated at 50 H.P. each at 600 volts. The control equipment gives the usual series-parallel connections by means of a foot-operated master controller and a main controller situated at the extreme rear of the coach, under

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the back seat. The acceleration in the series and parallel positions is automatic, the contactors shorting out the resistance steps being closed by cams which are operated by a compressed air engine, the operation of which is controlled by an accelerating relay, which ensures that each step of resistance is cut out when the motor current has dropped to a definite value. The transition from series to parallel is not automatic, but is achieved by the movement of the master controller pedal. The cutting out of resistance can be stopped at any point by a slight backward movement of the pedal. The arrangement gives nine steps in both series and parallel positions, so that the acceleration is very smooth.

The reversing switch is of the drum type and is placed on the driver's left. It has the usual three positions: forward, off, and reverse. It is interlocked with the control pedal in the usual way.

No electric braking is used on this trolleybus, though ordinary rheostatic braking can be fitted if required. The transmission is through two propeller shafts—one for each motor. The gear ratio is 11 to 1. All four wheels are fitted with compressed air brakes, and a hand brake operates on both propeller shafts.

### Twin Coach Co.'s Trolleybus.

Another design of trolleybus, illustrated here, is that built by the Twin Coach Company. It has a "symmetrical" body, seating forty-two. The trolleybus weighs 16,500 lbs. The interior view shows the seating arrangements, which are typical of American practice. All these trolleybuses are about eight feet wide, which makes them much less crowded laterally than the English buses, which are limited to about seven feet in width. The tyres are 40 in. by 10.5 in. on the front, and 38 in. by 7 in. duals on the rear wheels. The entrance is in front of the front wheels, and a treadle-operated exit door is arranged at the rear.

The transmission system, which is similar to that of the A.C.F. coach, is clearly shown in the accompanying illustration, and consists of a separate propeller shaft for each motor. The gear ratio is again 11 to 1. The electrical equipment in this case is of Westinghouse manufacture, and consists of two 50-H.P. series motors (35-H.P. motors are sometimes used), arranged for series-parallel control with a foot-operated master controller and a main contactor controller situated under the rear seat. In this case the cutting out of resistance is achieved by the operation of electromagnetic contactors, and an accelerating relay is used as before.

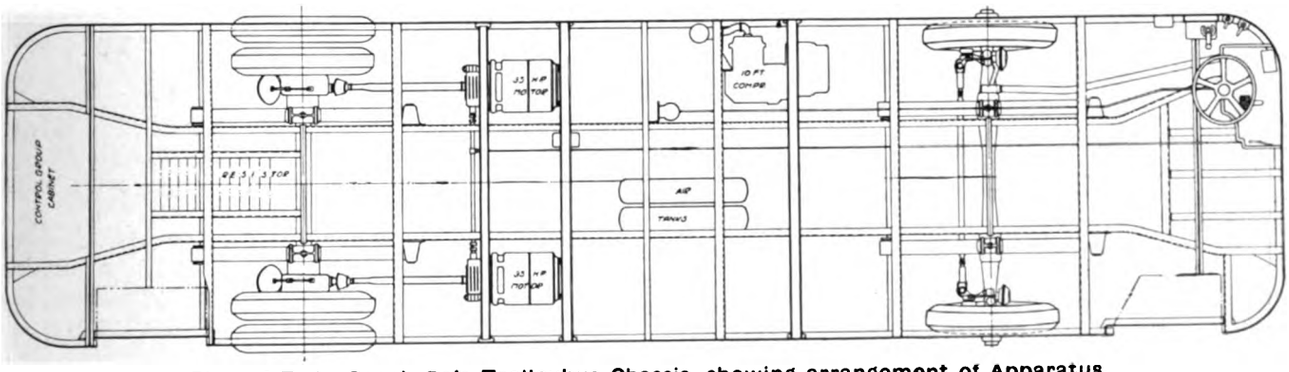
There are six steps in the series and five in the parallel connections. The hand-operated reversing switch has four positions, the extra one being "emergency braking." When the switch is in this position the motors are short-circuited on each other, and give a powerful braking effect for use in emergencies. The mechanical brakes are similar to those described in the case of the A.C.F. coach.

### Operating Costs.

The superiority of the trolleybus over the motor omnibus except for very light service is now recognised by responsible authorities on this continent. Apart from the advantages of high and smooth acceleration, little noise and no smell, and absence of vibration, there is the important advantage of lower maintenance and operating costs, as shown in the comparative figures for Salt Lake City. Under average conditions operating costs for trolleybuses, excluding fixed charges, are about 21 cents per bus-mile. The interest and depreciation on the trolleybuses may be taken as 17 per cent., and on the overhead line as 10 per cent. A modern American trolleybus costs complete, about $12,500, while new overhead construction costs from $7,000 to $9,000 per mile, depending on the type of construction used.

The long-established street car seems in no danger of being replaced by trolleybuses where the traffic is heavy, for example where the rush-hour headways are less than five minutes, but the trolleybus is being recommended for use where the traffic is lighter than

Twin Coach Co's Trolleybus, with Westinghouse Equipment.




Plan of Twin Coach Co's Trolleybus Chassis, showing arrangement of Apparatus.

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this, up to a rush-hour headway of fifteen minutes. For still lighter traffic, the motor omnibus is advised.

There is little doubt that the trolleybus would be the more satisfactory vehicle even with dense traffic; the seating capacity of the usual street car is little more than that of the trolleybus, and in Chicago at the present time the trolleybuses are running during rush hours with a two-minute headway. Where the street car is in operation, where traffic is heavy there is no great economic incentive for adopting trolleybuses, although the question of traffic congestion may help to accelerate the adoption of the modern system.

The number of trolleybus installations is at present small, but the merits of the system are being more and more realised. There are thousands of miles of street car route in operation where the density of traffic does not justify the upkeep of a track system, and as time passes and the track wears out one may reasonably expect to see the trolleybus installed.

At present, to the writer's knowledge, there are no modern trolleybus systems operating in Canada. The street car has proved a financial failure in many small cities and has in such cases been replaced by the motor omnibus. In the large cities the traffic in the business areas is usually heavy enough to make a track system profitable, but traffic congestion is becoming more and more acute. To be at all adequate a street-car system in a large Canadian city must have many miles of route in the extensive suburban

Interior of Twin Coach Co's Trolleybus.

districts where the traffic is certainly not sufficient to justify its construction.

There is undoubtedly an interesting future for the trolleybus in North America; a future, as far as Canada is concerned, of which British manufacturers should be acutely aware.

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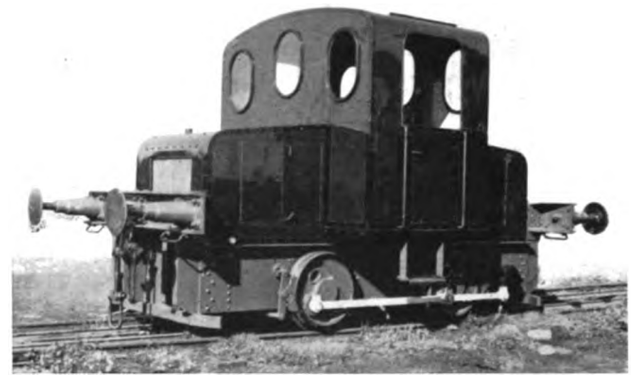
TRAMWAY DEVELOPMENT IN AMERICA.—Mr. R. S. Tompkins, of the Baltimore United Railways and Electric Co., commenting on the tramway industry in America, recently said that after having been in the dumps for many years industry has started to modernise its plant and equipment. It is replacing heavy, slow vehicles with light, fast cars which are being made more comfortable.

ELIMINATING STOPPING PLACES.—An illustration of what can be done in speeding up car services by eliminating unnecessary stops is afforded by the Broadway division of the St. Louis street railways, on which the service has been speeded up to an average of 12.35 m.p.h. This is now St. Louis' fastest line. On another route there is the high average of 12 m.p.h

## A DIESEL SHUNTING LOCOMOTIVE.

One of the latest Diesel locomotives to be shown in this country is the "Jung", made by the well-known German firm of that name. The concessionaires for the United Kingdom are the Standard Steel Co. (1929), Ltd., 72, Purley Way, Croydon.

Our illustration shows the general appearance of this locomotive, which is designed for shunting purposes.



The "Jung" Diesel Shunting Locomotive.

It has all the advantages of the Diesel engine using crude oil, compared with the petrol driven machine.

The engine is a twin-cylinder two-stroke Diesel. It has a continuous output of 32 m.p.h. at 600 r.p.m., and can be overloaded temporarily to the extent of 10 per cent., so that 35 h.p. may be relied upon for starting. The number of revolutions is purposely kept low, owing to the makers' experience that a slow running engine of robust construction is invariably preferable to a fast running engine, which is inclined to wear quickly. The engine itself produces the compressed air for starting, which is done without difficulty, and this is of course a great advantage in cold weather. All parts are automatically lubricated, and an air filter guards against dust and dirt.

The drive is by shaft, so that there are no driving or coupling chains. There is a three-speed gear, 3.1, 6.2, and 9.3 m.p.h. An exceptionally heavy flywheel is fitted to ensure smooth working, and a plate clutch flanged to the flywheel giving the intermediate stage of power transmission is operated by a foot pedal extending across nearly the whole width of the cab. A speedometer showing the varying speeds enables the driver to tell if the revolutions are falling owing to overloading, if the clutch is slipping, or if the gear is the most advantageous.

In shunting, smooth running and quick speed changing are of great importance, and a regulating device enables the revolutions to be fully reduced, the even torque of the machine remaining unaltered.

The framework and body work are built for strength. The axles run in self-aligning bearings and the wheels are steel tyred. A powerful cheek brake works on all four wheels, and there is a sander. The mechanism is enclosed by platework reinforced by angle iron.

With a working weight of 10 tons this locomotive has a tractive power on the straight level of 150 tons, and under full load the fuel consumption is stated to be only 6.7 gallons per horse-power-hour. The gauge is 4 ft. 8½ in., and the wheelbase is 5 ft. 3 in. Smaller locomotives with similar features are supplied.

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# WARSAW'S MUNICIPAL TRANSPORT.

## Projects of Tramway and Omnibus Extension—Proposed System of Underground Railways.

The city of Warsaw has grown and thriven in recent years, and the municipality is now facing courageously the transport problems which confront a city of narrow streets and congested traffic. Growing suburbs necessitate increased and speedy transport. A ten years' programme of tramway and omnibus extension is now in progress, but as these means of transport are unable to provide the facilities and speed required, the building of two electric underground railways, one north to south and the other east to west, is to be undertaken next year.

### The Tramways.

Electric tramways have been in operation in Warsaw since 1908, but they have had a chequered career owing to the European war and the subsequent war between Poland and the Soviet Republics. The money for their construction was raised entirely by the city, but the actual working was entrusted to a company. At first only the central part of the city—about 22 miles of the most frequented streets—was served by the tramways, the outlying districts being provided with the service later. Some forty millions of passengers were carried yearly, and as the numbers steadily increased the management decided on further development. These plans were, however, interrupted by the war, which not only stopped the progress of the undertaking, but brought it to a state approaching decay.

In May, 1916, the German occupation authorities took over the administration of the tramways and maintained the service until November 11, 1918, the date of the Armistice. During that period war conditions and the demands of the Army of Occupation had caused great losses to the operating company, besides reducing the efficiency of the system. The city authorities subsequently undertook the management, the contract with the private concern being dissolved by mutual consent.

Immediately after taking over the system, the municipal management instituted much needed improvements. The early realisation of these plans was stopped by the Polish-Soviet war, which reduced the personnel and left the completion of the work to the future. The climax came in November, 1920, when there were only 76 cars in operation, and it was not until 1921 that the restoration of the tramways was energetically undertaken. Despite the difficulties which were encountered in running the worn-out rolling stock, the work of improvement now progressed very fast. Efforts were primarily directed to extending the track and adjusting it to the changed needs of Warsaw, which in the meantime had become

One of the Municipal Tramcars with Trailer, Warsaw.

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the capital of Poland and a city of no mean size. Thus the outlying parts of the town, which had no means of transport, were connected with the central part of the city.

In spite of the losses during the war, the German occupation and the economic crisis of 1926, the Warsaw tramways, both in technical equipment and quality of administration, are now much better circumstanced than was the case before the war, although the undertaking then had the advantage of a very well organised staff. The value of the tramways has increased from 24.9 millions of Polish marks in 1918 to over 85 millions at the present time; and the undertaking now employs about 5,600 individuals, compared with about 2,000 in 1918.

To-day all the important outlying districts have tramway communication with the city. The total length of route in 1918 was 27 miles, and it now measures 61 miles. Along with the extension of the track, the rolling stock has been increased, the electric power plant enlarged, a new car depot built, the cable system extended, and the mechanical workshops enlarged. Before the war the rolling stock numbered 236 cars, and at the conclusion of the war only 157.

The Electric Power Station, Warsaw Municipality.

Now there are 365 motor cars, 307 trailers, and 46 freight cars. In the enlarged power station two new turbo-generators have been installed, representing 2,500 kw. and 4,000 kw. respectively; four new steam boilers, each with 300 square metres of heating surface, have been added to the existing ones; while the current distributing station has been rebuilt and a new installation of the three-cable type introduced.

Among other improvements steam from the turbines is now used for heating the administrative buildings of the tramways about half a mile away, by means of pipes connected with the heating apparatus in the office buildings, mechanical plant, depot, school, etc. To meet the steady growth of Warsaw and the expected extension of the tramways into the suburbs beyond the present city limits, an automatic sub-station of 3,000 kw. has also been built at the depot at Praga.

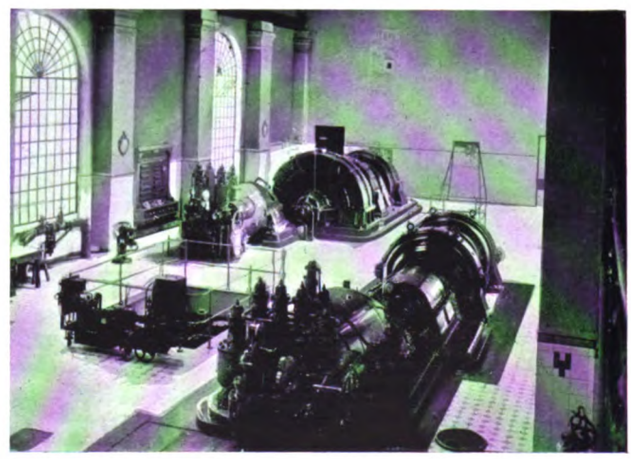
The overhead cable system—reduced during the war to 22 miles owing to the compulsory requisition of copper by the German Army of Occupation—has now been increased to 99.5 miles. A new depot has been erected to accommodate 200 cars in the suburb of Praga, and includes a workshop and administrative buildings. Another depot built at Rakowiec holds one hundred cars, but it can be enlarged to accommodate 200. The workshops at Wola have also been enlarged, a new joiners' shop and a painters' shop being added. As the old administrative building soon proved too small to hold the necessary offices, a new building has been erected.

Besides the purely technical and business sides of the undertaking, the management makes special efforts to meet the social and educational needs of

A Sub-station of the Warsaw Tramways.

the employees. Medical help was the first of these activities to be organised, and now all employees are entitled to medical assistance, with the advantage of having many specialists to consult. All necessary medicines are provided free of charge. Next the educational side was organised on the basis that the tramways department pays the whole or greater part of the school fees of employees' children, whether in State or private schools.

Besides this, the undertaking, out of its own funds, erected a building which houses a primary school and a municipal high school. Adjoining these is a kindergarten, where children of employees from three years of age are taken care of and also taught to read and write; shortly there will be a kindergarten at every depot. The committee in charge of these



Interior of the Warsaw Municipal Power Station

activities has also provided accommodation at the resort of Mienia, near Warsaw, where children of employees are sent during the summer.

Although the tramway system has been extended considerably, it has proved insufficient for the needs

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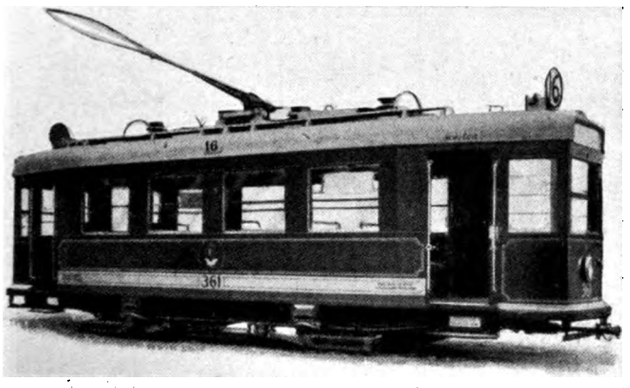
of the steadily growing city. In 1918 about 95 millions of passengers were carried; in 1928 the number had grown to 257 millions. To deal with this increased and increasing traffic the management in 1928 decided to inaugurate omnibus services. Such services had been operated between 1920 and 1925 to the suburbs which at that time had no tramway connection with



A Typical Tramcar used in the Warsaw System.

the city. In 1920 there were eighteen single-deck omnibuses and five tender cars, and gradually these increased to 46 omnibuses and eight tender cars. Depots were built at Muranow, Wola, and Praga, the buildings at Wola including a repair shop. In 1925 the omnibuses were withdrawn except one service, as the tramways had been extended into the suburbs, and the last omnibus service was withdrawn in 1926. It should be mentioned that the omnibus services always showed a deficit, owing mainly to constant repairs to vehicles damaged on the defective pavements of the suburbs.

In view, however, of the overcrowding of the two main tramway lines running through the city, and of the impossibility of giving a more frequent service, the management decided to introduce omnibuses into the city. The first service was put into operation in 1928. This route, which is between the two main lines of the tramways and almost parallel to them, proved to be very necessary, for it was crowded at certain times of the day. Even this line did not sufficiently relieve the tramways, and it was discovered

A Municipal Omnibus at Warsaw.

that this new omnibus artery could stand more traffic. Two new services were, therefore, started, and at the end of 1929 the total length of the omnibus routes was six miles, with 23 vehicles in operation.

### A Big Development Scheme.

Still the traffic needs of Warsaw are unsatisfied. The population feels the great necessity for more transport both in city and suburbs. For this reason the authorities recognise that a further development of the tramway and omnibus systems must take place, despite the difficult conditions that exist in the city—narrow streets, lack of more straight line arteries, and the great increase in motor car traffic. The scheme of development for the period 1928–38 includes the extension of the tramway system to nearly 100 miles and the omnibuses to another 30 miles. This will necessitate a considerable increase in the rolling stock (264 tramcars, 198 trailers, and 180 omnibuses), the further enlargement of power by 8,000 kw., and the building of additional depots and workshops.

All this, however, will not solve the transportation problems of Warsaw. The city is so large that many people have to travel long distances every day. Rapid transport is, therefore, required, and neither the tramways nor the omnibuses are able to give the necessary speed. Further, life in Warsaw concentrates mainly in a few points of the city, which are already

One of the Warsaw Municipal Transport Workshops.

overcrowded with vehicular traffic and will not permit any further increase of tramcars or omnibuses.

### Underground Railways to be Built.

In the foregoing circumstances it has been decided that the only possible solution of the traffic problem of Warsaw is to build either underground or elevated railways. The necessity of such a railway has been recognised both by the authorities and by competent engineers who have been consulted. It has been decided, therefore, to construct one underground line thirteen miles in length, running from north to south, and another at right angles to it from east to west, connecting Warsaw with the suburb of Praga. The preliminary work is now in hand. On both lines test borings have been made to ascertain the nature of the soil and the sub-surface waters. At present plans are being prepared for the stations and for the necessary changes in the sewer, water, gas, and electric systems.

Independent of this, there is a special committee, with the Mayor of Warsaw as the chairman, which considers the financial side of the undertakings and considers the offers by various bodies either of financial or technical help. It is expected that this year the plans for these works will be finished, and that the construction of the underground railways will be commenced next year.

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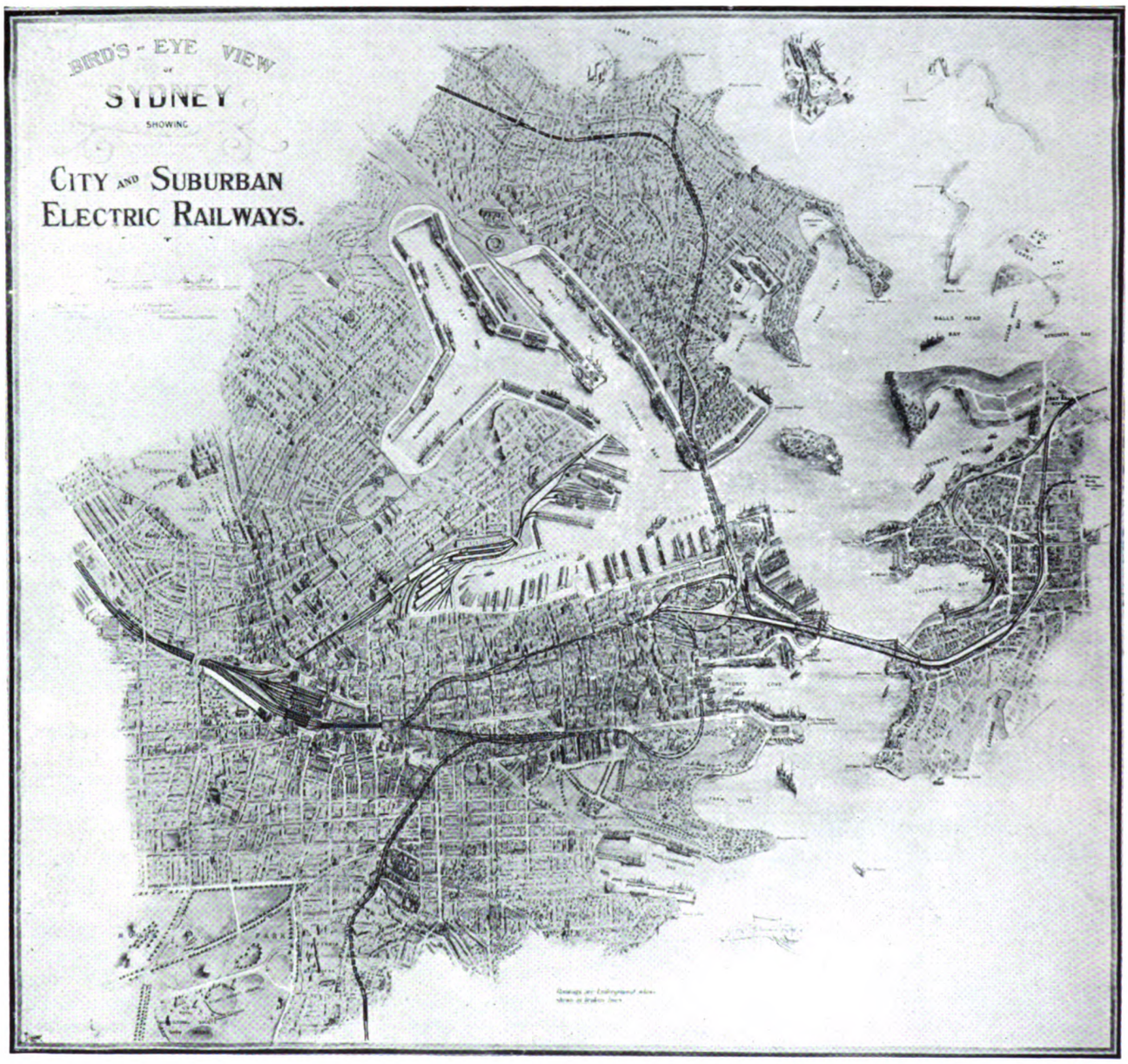
## SYDNEY SUBURBAN ELECTRIC RAILWAYS AND THE NEW HARBOUR BRIDGE.

The electrification of Sydney City and Suburban Railways is one of the most important projects of its kind yet undertaken. Its inception dates from 1915, when the problem of providing improved transport facilities for a rapidly increasing population was investigated by the New South Wales Railway Commissioners. A full report on the "Proposed Electric Railways for the City of Sydney" was prepared by Mr. J. J. C. Bradfield, then chief engineer of Sydney Metropolitan Railway Construction, after a personal study of the electric railways operating in Europe and America, and on the basis of this report a very comprehensive scheme was adopted.

This scheme, which is shown in outline in the map, provides for the construction of an underground loop railway for two-way service in the city of Sydney itself, a number of new lines into the outlying districts, and for the gradual electrification of practically all the railways within an area of about twenty miles radius, the total amount of electrification being about 400 track miles. The work is bound up with the gigantic new bridge, now nearing completion, across Sydney Harbour; for one of the most important railway extensions is a new section of line which will pass over the bridge, forming a direct route from Sydney City to the north.

The commencement of work was delayed, owing to the war, and it was not until the year 1923 that the specifications were issued covering the rolling stock and equipment for the first section to be electrified—the Illawarra line between Sydney Central Station and Sutherland. The main features of the original plan were adhered to, including the decisions to adopt multiple unit trains and the overhead trolley system. In 1925 a contract was placed with the Metropolitan-Vickers Electrical Company for complete electrical equipments for 150 motor coaches and 150 trailer coaches. Later an additional contract was placed with the same company for similar equipment for 101 motor coaches and 101 trailer coaches. Details of the electrical equipment were given in the issue of the TRAMWAY AND RAILWAY WORLD for November 11, 1926.




Map of Sydney and Suburban Electric Railways.—The position of the New Bridge is seen on the right.

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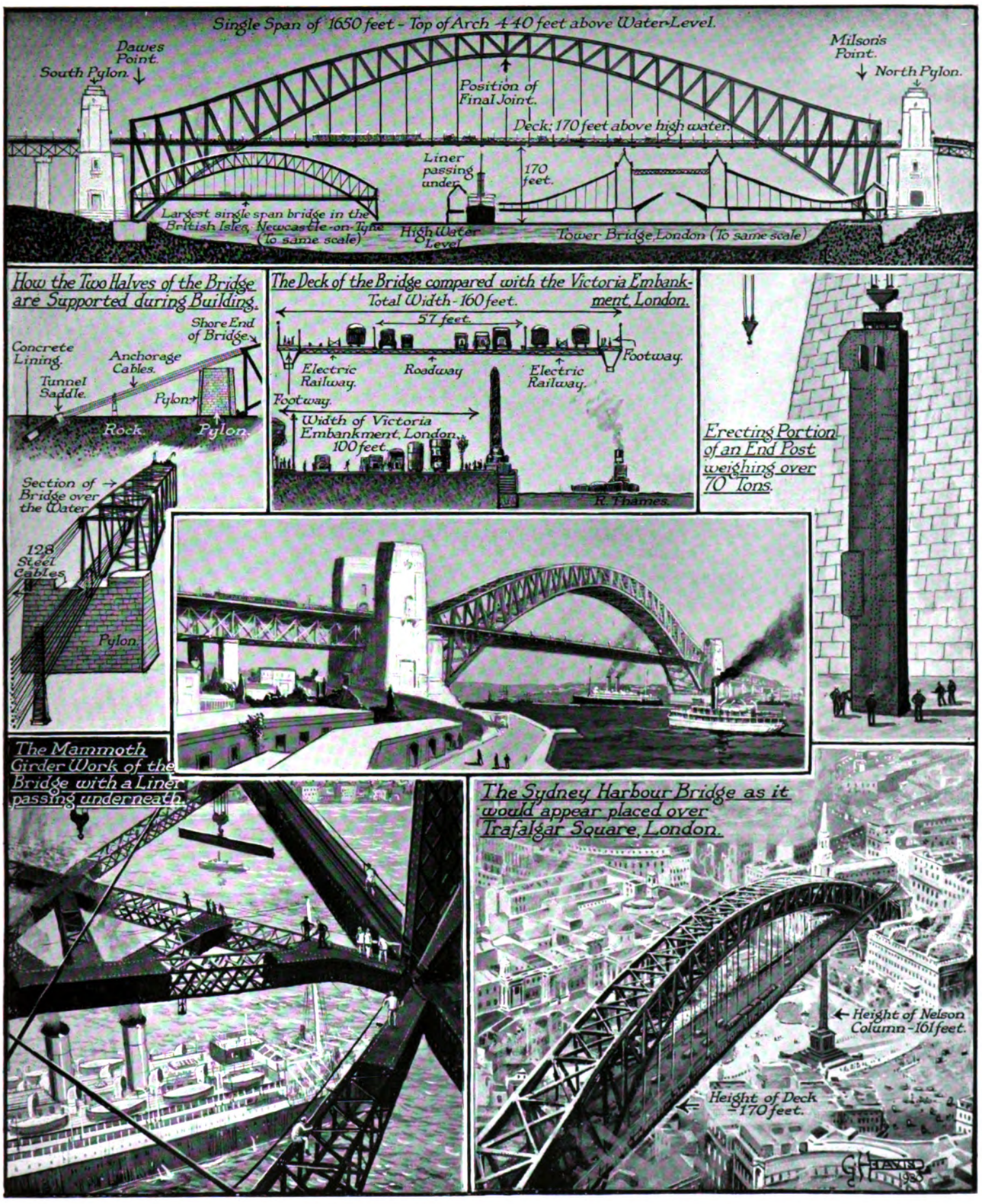
## THE GREAT NEW BRIDGE AT SYDNEY.

*Drawn by Mr. G. H. Davis from information supplied by Messrs. Dorman, Long & Co. Ltd.*




The view in the centre shows the Bridge as it will be when completed.

The new span bridge, which is an important feature of the railway extension scheme, is the largest of its kind in the world. On August 19 the two halves of the immense arch were united, the two arms being fastened on the central pin in perfect alignment. The bridge, which has a span of 1,650 ft., will carry a large volume of traffic and the deck, 170 ft. above high water, is exceptionally wide. The arch alone contains 37,000 tons of steel—all Australian and British—and the whole structure, with the approaches, will cost over £6,000,000. The work is being carried out by Messrs. Dorman, Long & Co., Ltd. The detailed designs and erection scheme were prepared by Mr. Ralph Freeman, of Sir Douglas Fox & Partners, and Mr. C. S. Imbault.

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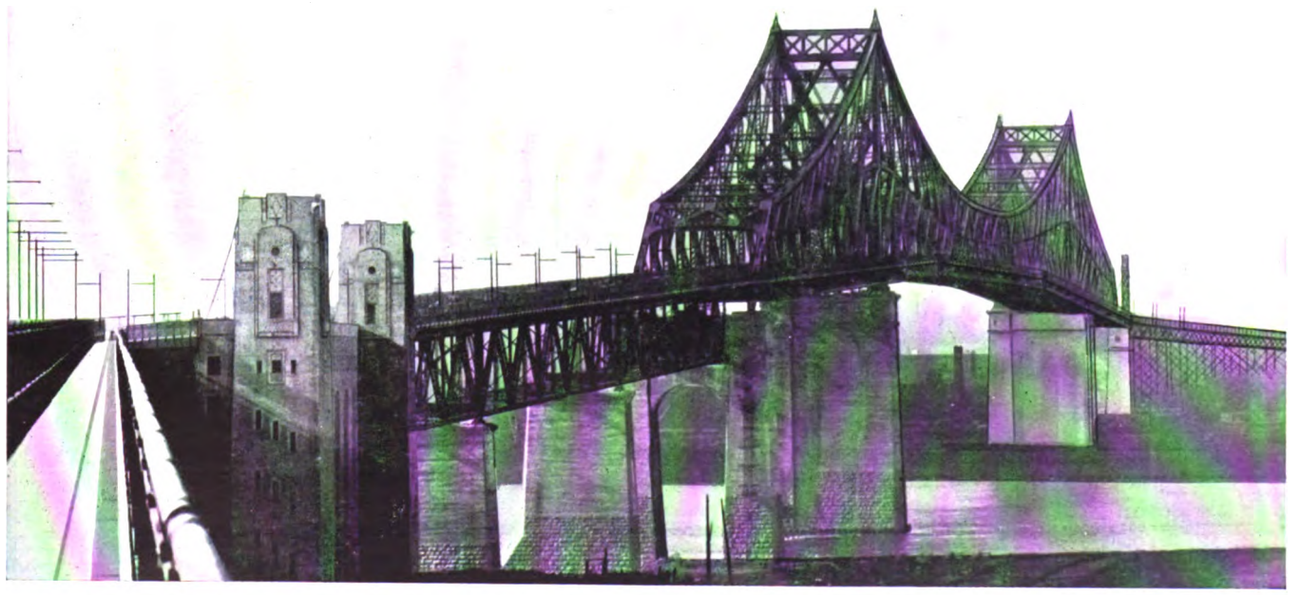
## TRAMWAYS ACROSS MONTREAL HARBOUR.

A great new bridge spanning the St. Lawrence was opened on Victoria Day, May 24, by the Rt. Hon. W. L. MacKenzie King, who was then the Prime Minister of Canada. From entrance to exit the bridge is exactly two miles in length, and within view of it is the Victoria Bridge, which was inaugurated seventy years ago by the late King Edward VII, at that time Prince of Wales. The roadway is 37 ft. 6 in. wide, giving accommodation for four lines of traffic. On each side of the roadway the Montreal Tramways Company has constructed a track, which is of open-deck design except at special points. Outside of the tramways are foot pavements, both the pavements and the roadway being fenced off from the tramways.

The cost of the bridge has been £4,000,000, and the work of construction has occupied five years. It crosses the harbour of Montreal, and rises to a height of 155 feet above high water level over the ship channel. Erection of steel commenced from the south shore in September, 1926, and in the following year was being carried on simultaneously at both ends, the final linking up taking place on July 10, 1929. The steel superstructure was entirely completed by the beginning of October last year, or nearly a year and a half ahead of time, the contract requiring completion by March 1, 1931.

Bridge Carrying a Tramway across Montreal Harbour.

The central span extends for 500 feet, and the total fairway for shipping is 1,000 feet. This span is a cantilever structure with two 420-feet anchor arms. The remainder of the steel superstructure comprises



A near view of the Bridge Showing Tramway Standards.

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twenty-four truss spans on the east side over the shallow unused branches of the river from the south shore to the islands, and sixteen spans on the city side. The steel spans range from 90 to 254 feet in length. The total weight of steel in the bridge superstructure is 30,000 tons, about half of that weight being due to the principal span.

The tramways, omnibuses, and other automobiles are likely to bring about considerable development of the municipalities on the north side of the river and of the growing suburban towns south of the St. Lawrence, forming part of the greater metropolis. To accommodate the great stream of traffic which enters and leaves the city over the new bridge it has been necessary to provide guard-rail enclosures for entrance and exit, and at each end of the bridge there is a toll station. The Federal Government has approved the tariff of tolls which has been framed by the Harbour Commissioners. During the first nine days the bridge was open more than 50,000 motor cars passed over, paying $20,000 in tolls.

## SCAVENGING OF TRAMWAY TRACKS.

By L. E. Harvey.
*Engineer and General Manager, Ilford Corporation Tramways.*

Under the Local Government Act, 1929, the upkeep of county roads in the areas of county boroughs, boroughs, and district councils is to be handed over by the counties to those authorities, and grants are to be made for their maintenance and cleansing. The County Council of Essex has given a lead in the matter by granting an allowance for scavenging of 25 per cent. of the expenditure for impervious roads, and 50 per cent. for pervious roads, with the proviso that *no allowance whatever is to be made for the road surfaces within the statutory limits of the tramway area.*

Under these circumstances the Highways Departments are looking to the Tramways Departments to reimburse them for scavenging the tracks.

It may be interesting, therefore, to review the position from the light of legal decisions and common practice. Section 28 of the Act of 1870 says that the promoters are bound to "maintain and keep in good condition so much of the road surface as lies between the rails of a tramway, etc.," and this is claimed to embody the scavenging and cleansing and watering of the surface.

Up to the advent of electric traction there is no recorded case in which it has been held that this scavenging or cleansing is part of the "maintenance" of a tramway. (See R. *v.* Essex J.J., 1888, Burnley Corp. *v.* Lancashire C.C., 1889, and Dublin United Tramways *v.* Fitzgerald, 1902.)

On the other hand it is of great value shortly to review the case of Acton U.D.C. *v.* London United Tramways. This action concerned a fall of snow, and was heard before Judge Rowland Roberts at Brentford, the facts being that the Tramways Company had ploughed the snow from its portion of the road and left it piled on the haunches,and the Urban Council claimed damages for the extra cost of the removal of this.

In his written and considered judgment Judge Roberts said :—

It was contended by the plaintiff's counsel that scavenging is included in an obligation to maintain and repair a road. In the absence of authority supporting this contention I should not feel at liberty to place this wide construction upon the terms used in section 28, which, I should have thought by the use in collocation of the words "condition," "repair," and "materials," ought to be used as limited at any rate to that class of reparation which is rendered necessary by some degree of alteration in the materials and substances forming part of the roadway. Further, *it seems clear that the normal scavenging of the whole surface of a road upon which tramways are laid is a duty which still remains to be discharged by the road authority*, who are in this case represented by the plaintiff council. I refer, of course, to the scavenging necessary for the maintenance and convenient use of the road surface, and not merely to the scavenging done by the council, in this case as a sanitary authority.

Damages of £25 were, however, given to the Acton Urban Council, and the Tramways Company appealed against this.

Evidence was then heard on the appeal, and Mr. Justice Darling considered that the appeal of the Tramways Company should be allowed with costs and the appeal of the Urban Council as against the judgment in favour of the Tramways Company should be dismissed with costs.

Mr. Justice Walton agreed and in the course of his judgment said :—

*I do not think that scavenging for the purpose either of cleansing or for the purpose of making the road more convenient for traffic*, as distinguished from removing an obstruction to traffic, *does fall within section* 28 *of the Act of* 1870.

The appeal of the Tramways Company was allowed and the appeal of Acton Council dismissed.

While it may be said that the *obiter dicta* of Judge Roberts and Mr. Justice Walton do not lay down the law, they are nevertheless an expression of opinion that has not been controverted before or since, and I think it may be fairly said that there is nothing in law to support the contention that scavenging is part of the duty of a tramway authority.

Now as to common practice. As far as I can ascertain up to the present time no tramway authority makes any payment to a road authority for scavenging its track, and therefore from common usage no case has been made out unless circumstances arise that alter existing conditions.

It has been claimed that no paving of a road can be maintained unless it is properly scavenged. This may be true as far as concerns macadam roads, but I cannot agree that this applies to the granite sett paving of tramway tracks. And in any case, if it should be so, then it is entirely the business of the tramway owners, who are themselves responsible for the maintenance of their portion of the road, and does not concern the Highways Department. If the tramway owners consider that the risk to the maintenance of their paving by failing to scavenge the surface is justified, then it is their concern and theirs only.

There is another aspect of the case that might have a moment's thought. Under the recent reassessments most tramways have had their rateable value considerably increased. What return do they get for the rates they pay ? They do not enjoy with other ratepayers the benefit of education, libraries, maternity and child-welfare, etc., but surely they are entitled to have some return for their money in the cleansing of highways, which is given to other ratepayers, and they should not have to pay twice for the same service.

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The Editor will consider contributions offered for publication in THE TRAMWAY AND RAILWAY WORLD (including the Omnibus and Coach Section) by those conversant with the subjects that come within the scope of this journal. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, SEPTEMBER 18, 1930.

**Industry and Politics**

Although politics, in the ordinary use of that word, find no place in these pages, we in common with all good citizens are deeply concerned with politics in the true meaning of the word—the welfare of the nation and of industry on which that welfare so largely depends. It would be idle to deny that increasing anxiety is being aroused among those engaged in industry by the levity with which leaders of all parties treat matters of industry and finance. It appears to be thought that whatever course Government pursues the work will go on and capital will increase. There is no greater mistake in the world. Industry and capital are plants of delicate growth; they may for a time resist unfavourable conditions; but in the long run, unless fostered, they will wither and die. While politicians render lip service to trade and industry they are not vitally concerned with them. They regard them largely as pawns in the great game of winning and holding power, which in these days means the capturing of the untrained, and — more or less — unintelligent voter. The country's need above all else at the present time is for serious leaders whose aim is not consistency with worn-out formulas, but the establishment of a policy which will revive industry and enable our increasing population to provide itself with the means of subsistence. We depend for our prosperity more largely than is generally understood upon our export trade, and any policy that does not provide for its continual extension is fallacious and futile. The export trade is the keystone of the Imperial arch; dislodge it and the whole edifice will lie in ruins. No efforts to improve social conditions can gain ultimate success which are not based upon a vigorous and expanding industry. That is the first essential.

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**Traffic Act and Trolley Vehicles.**

A detailed survey of the Road Traffic Act, as published in its final form, confirms the impression caused by its earlier changing versions that it has no practical bearing on tramways, which are already under statutory regulation. But that healthy hybrid, the trolley omnibus system, comes under the Act to a certain extent. It is provided that certain sections of Part I of the Act shall apply in the case of trolleybuses, as in the case of other omnibuses. These sections relate to the licensing of drivers, their physical fitness, disqualification for offences, and endorsement on licences. While there is nothing in the Act about tramcar drivers, it may be presumed that the points are covered under existing legislation. Again, it has to be remembered that the driver of a trolleybus has to steer his vehicle, a duty which does not fall on a tramcar driver, whose car is confined to its rails. A trolleybus could conceivably go off the road, though perhaps not so easily as a petrol bus. Further on it is provided that Part II of the Act (provision against third-party risks) shall not extend to tramcars or trolley vehicles, the use of which is authorised by Act of Parliament. Doubtless, it is the last mentioned fact that exempts these two classes of vehicles from the elaborate provisions of the Act requiring users of motor vehicles to be insured against third-party risks. In regard to tramway undertakings, all are familiar with the fact that successful actions for damages can be brought against them at ordinary law, and that these undertakings, unlike some private car owners, can find the money necessary for paying damages. For the same reason, doubtless, local authorities and police authorities do not require

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to insure. Another point worth mentioning is in reference to the erection of notice-boards. One section provides that a highway authority may, by direction of the Minister, cause or permit traffic signs of prescribed type to be placed on or near any road in their area. No other traffic signs are to be permitted. There are exceptions, and one of them is that the above shall not apply to any traffic sign placed by the owners or workers of any tramway, light railway, or trolley vehicle undertaking. The above appear to be about the only points of direct reference in the Act to tramways and trolley-buses. It is, however, a long and complex Act, and perhaps the lawyers will be able to dig more out of it in regard to electrically-propelled vehicles. They will probably find that they have a rich field to work upon.

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**Glasgow's Successful Record**

On another page we publish a review of the Glasgow Corporation Transport accounts for the past financial year. It is a record of which that great and enterprising city may well feel proud, for it shows successful results over a long period of years. The undertaking emerges, at May 31 last, with its loan debt of over three million pounds more than covered by its depreciation and renewals fund and other reserve sums. Also when considering the position we must not overlook the huge totals paid to the Common Good Fund, to the city and county rates, and in road maintenance. Both the tramways and the omnibuses have a share in these results, although of course the tramways constitute much the greater part of the transport system, the municipal omnibus services having started only as recently as December, 1924. The unfortunate department is the subway, Glasgow's underground railway, and it must be galling to the Transport Committee to be saddled with the losses of this system, which have to be borne by the tramways. While we may expect to see the tramways remain at their present mileage, future years will witness great extensions of the omnibus services; and in this department Glasgow Corporation now has the benefit of protection against private competition within the city area. At the same time this monopoly gives them added responsibility, and it is to be hoped that they will make an amicable arrangement with the omnibus companies who have hitherto plied for hire in the city streets. That cheap fares give the most profitable returns seems to be the experience of the Glasgow tramways, where the fares are the lowest in Europe. The Transport Committee are in the position of a manufacturer selling an article produced on mass production principles whose object is to get a sufficiently large number of buyers which will enable him to sell at a small profit that, multiplied sufficiently, gives an aggregate net gain of respectable dimensions. Circumstances are not always so favourable for such low fares as operate in the great Scottish city, and some courage is required by others who are tempted to risk the loss involved if the public do not take advantage of the cheap fares in sufficient numbers. Glasgow's success is the result of many years of wise management combined with enterprise and the public-spirit of its citizens. Let Glasgow flourish!

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**Progress in Transport Facilities.**

If they are to prove profitable the facilities offered by present forms of transport cannot be regarded as final any more than the methods of transport themselves. This home truth will doubtless be reflected in Councillor Gledhill's paper on "The transition of transport between 1928 and 1930," which he is to submit to the conference of the Municipal Tramways and Transport Association. Support for the tendency of the medium itself to change may be derived from Mr. Vane Morland's paper on the development of the heavy oil engine for traction work, an innovation that will certainly affect the petrol omnibus and possibly the tramcar in certain circumstances. Lessons regarding the necessity of maintaining facilities on a scale of efficiency and comfort have been taken to heart during the past few years both in London and the provinces. One is that the public will use the most attractive vehicle. Recognition of this fact, in the case of the London County Council Tramways, became the main factor in converting a net loss into a substantial profit. On the other hand the L.G.O.C., with many of its vehicles nearing the time for replacement, was forced to go slow in the task of conversion to pneumatic tyre operation, with

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the result that on the country routes especially passengers were captured by the more comfortable coach or independent omnibus. Attacked in time this reverse has been turned into a prospect of increasing financial success attributable to the use of omnibuses of new design, which are attracting patronage and effecting economies in operation. With the single-deck type of vehicle London is being introduced to the limited stop form of service extending far out into Greater London, an innovation that is also countering the competition. The value and necessity of progress is further attested by the decision of the London Underground Electric Railway to use fifty escalators in lieu of the lifts at a dozen of the stations that are to be reconstructed in Central London and at four of the new stations on the extensions of the Piccadilly tube. This form of enterprise will not only speed up the traffic, but will relieve omnibus congestion caused by the disinclination in the past of many people to go underground.

## RISKS FROM SHATTERED GLASS.

One factor in the unfortunate accident to the L.M.S. express "Night Scot" at Euston, on September 1, should not be allowed to pass without comment. A considerable proportion of the thirty persons injured by the telescoping of the third and second coaches were wounded by the shattered and flying glass. It was only by a happy chance that more serious injuries were not inflicted, for there might easily have been loss of life resulting from this cause (as has occurred in too many motoring accidents, when drivers, or those seated near them, have been propelled through wind-screens). Now, it must be recognised that the present tendency in railway coach design, as is also the case with tramway-cars, to strengthen the frame-work while lessening the area of *solid* panelling necessarily leads to a more extensive use of plate-glass. It is the logical outcome of replacing the heavier with the lighter, stronger and more elastic steel. Though this is a system which has many points in its favour, and meets with the general approval of the travelling public, at the same time it unquestionably adds appreciably to the dangers to which travellers are exposed and consequently to the liability of operating companies.

Obviously the greater average speed of travelling prevalent to-day and the balanced stresses of frame construction, with its inherent propensity to buckling in the event of violent shock, largely increase the possibility of shattered glass flying with terrible force in all directions when an accident occurs. Such shattered glass, whether hurtling through the air or lying promiscuously among coach wreckage, is a very real, but an avoidable source of risk. The fact is, the danger can be, if not entirely eliminated, at least greatly mitigated by the simple precaution of substituting safety glass for ordinary glass. This policy of safety-first in glazing has already been adopted by certain tramway authorities and some concerns running omnibuses or other motor-driven public conveyances. The pity is that this policy is not universal on both road and railway.

No doubt the use of safety glass adds appreciably to the initial cost of glazing. Against this must be set the fact that the nature of the glass renders it practically immune from shock and the ordinary vicissitudes of everyday usage, so there is a saving in replacing. Then again, while a few years ago safety glass was, to all intents and purposes, a monopoly, now there are many Richmonds in the field, competition is keen and there is consequently a fall in prices, coinciding with improved manufacture. While this competition has given a widened scope for choice, it certainly entails greater vigilance in selection and urgently calls for the establishment of a recognised standard specification by which rival claims can be tested. Some progress has been made in this direction under the auspices of the Society of Motor Manufacturers and Traders and the British Standards Committee.

Apart from reduction in prices, competition has also brought about improved manufacture. The principle underlying the composition of safety glass is now fairly well understood: it is the placing of a thin sheet of transparent celluloid between two sheets of glass, with the use of a colourless, transparent adhesive agent. The quality of the cellulose is superior to what it used to be, and other chemical agents than cellulose acetate (which is apt to appear hazy under certain lighting conditions) have been adopted to secure better visibility and perfect stability. While these are essentials to a reliable and durable product, another outstanding advance has been in rolling the glass, which is now reduced to an approximate thickness of 6.5 millimetres, so that the complete "sandwich" is no more than a quarter of an inch thick. The increased cost of production of flawless sheets of thinner gauge glass has been counterbalanced by greater output and other economies. It is to be observed that this reduction in weight and thickness has not been at the cost of efficiency. A good safety glass, though thinner and more permanently colourless and transparent, still remains unsplinterable and unscatterable. It is possible with a fitter's hammer to make a hole in a sheet of safety glass, but the hole is clean, or rather even, not jagged, but friable and without power to cut. Ordinarily, a direct blow may star the sheet, so that pieces may be picked off, but it does not splinter and fly apart, while all edges are blunted, powdered, so that they cannot cut. Severe shock may fissure a sheet, but will not scatter it or produce a cutting cleavage.

When it is remembered that about 70 per cent. of fatal or serious motoring accidents are due to broken glass, the importance of this question is apparent. No statistics of railway casualties due to broken glass are available, but the total must be considerable, and, as pointed out, are likely to increase than otherwise. The steps taken by the tramway authorities alluded to above should become general, a good example having been given by the German Luft-hansa Line, which has fitted all its aeroplanes with safety glass, a policy gradually being followed by other air-lines. It is a sound one, both in the interests of the companies and the public.

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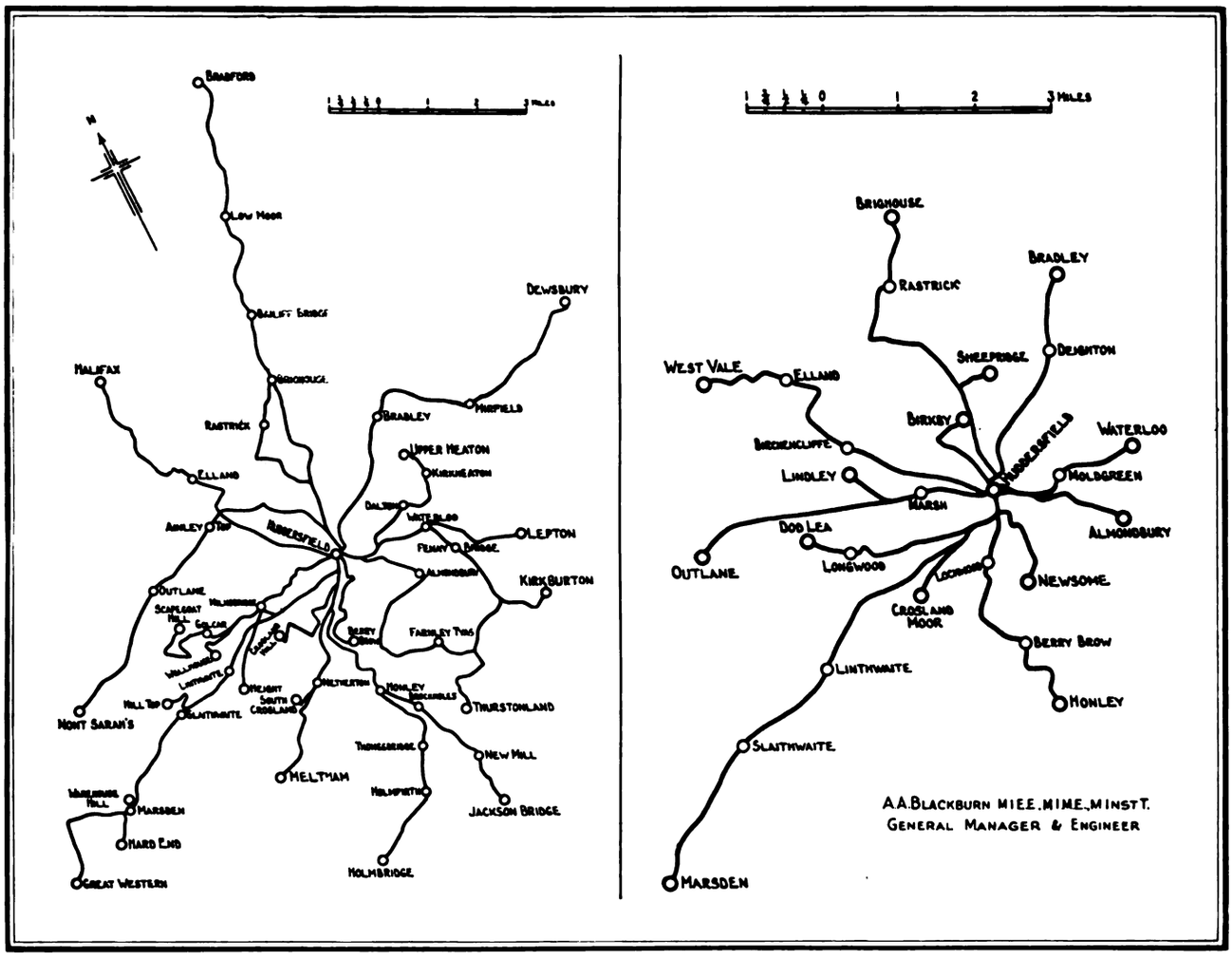
# HUDDERSFIELD TRANSPORT SERVICES.

**First Municipality to Construct, Operate and Develop Tramways.**

**124 Miles of Omnibus Routes Worked under a Co-ordinated Scheme in which the L.M.S. Railway is included.**

Huddersfield, a by no means unattractive town, presents to the visitor the added interest of a textile centre whose products are esteemed all over the world, and it has the good fortune of being situated next door, so to speak, to the leading British Spa of Harrogate. Therefore, when Huddersfield arranges to receive a numerous party of conference visitors the borough is able conveniently to entertain them at Harrogate, where so many such assemblies are held. For the visitors this plan has the advantage of securing variety in the programme and ample hotel accommodation.

In the case of the Conference of the Municipal Tramways and Transport Association, which is to be held at Harrogate on September 24, 25 and 26, Huddersfield has the distinction of providing the Association with its President for the current year in the person of Alderman Thomas Canby, J.P., who is chairman of the Tramways Committee and Deputy Mayor of the borough. The Mayor of Huddersfield (Alderman Walker T. Priest, J.P.) is a member of the Tramways Committee. Another point worthy of notice is that modern road transport enables some of the events of the Conference to be held outside of Harrogate, and visits are to be paid to Huddersfield and Leeds. On the morning of the third day motor coaches will convey the visitors over the 25 miles to Huddersfield for luncheon at the Guildhall, at the invitation of the Mayor and the chairman and members of the Tramways Committee. In the afternoon the coaches go on to Leeds, twelve miles away, where members will be entertained at tea by Leeds Tramways and Transport Committee.




The Tramway (left) and Omnibus (right) Systems of Huddersfield Corporation.

## Parliament and Municipal Working—The Steam Era.

From a transport point of view Huddersfield has an historic interest, in that it was the first municipality to construct, operate and develop tramways as a municipal

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enterprise. Under a Bill promoted in 1879, and sanctioned the following year, the Corporation in 1881 began the construction of tramways, but as the Act did not empower them to work the tramways, it was decided to lease them. During the period of construction the Corporation made every effort to effect a lease for working the tramways, but without success. They then decided to work the tramways themselves, and application was made for powers, which were granted by a licence of the Board of Trade, as provided for in the Huddersfield Corporation Act of 1882. The licence was granted subject to the following terms and conditions: "That the Board of Trade reserve the power to revoke the licence to the Corporation if, in their opinion, a company make a satisfactory offer to lease the line."

**Alderman Walker T. Priest, J.P.**
*Mayor of Huddersfield.*

After a trial with an engine and car on the steep gradient of Chapel Hill, steam haulage was adopted, the first engine and car starting on the Lockwood section on January 11, 1883. By 1885 all the routes, with the exception of Moldgreen, were being operated by steam haulage. Horse cars were tried on the Moldgreen section from 1885 to April, 1888, when steam cars were substituted. Absolute powers for working the tramways were obtained by the Corporation in 1897. After a few years it was found necessary to substitute the four-wheel cars with larger cars of the bogie type, and as the engines were unsuitable for this type of car, they were changed for engines of the locomotive type. The increased traffic soon had a serious effect on the permanent way, and from 1891 to 1893 general reconstruction and re-paving was carried on without interruption.

### Electrification—Links with Halifax and Bradford.

Subsequently extensions of the tramways were made into the urban districts of Linthwaite and Honley, with the result that the question of purchasing extra rolling stock had to be faced. The Council then resolved upon electrification of the undertaking, a task that was completed in 1902, the work having been begun in 1899. The first electric cars were run in February, 1901.

During 1907 the permanent way was reconstructed from single line to double line on the Lockwood, Moldgreen, Birkby and Edgerton sections.

In 1914 an extension was made to Elland and West Vale, linking the system with that of Halifax Corporation. Also in 1914 the Marsden extension was opened, this being the longest route—7.22 miles—from the centre of Huddersfield. In 1920 powers were obtained to construct tramways to Brighouse. Three-quarters of a mile of the track is laid on sleepers through fields. This extension was opened in March, 1923. It forms a direct link with Bradford.

The route mileage of tramways in operation is 38¾, or 62½ miles of single track, the permanent way which is in excellent condition, being under the supervision of the borough engineer. The department operates 132 tramcars. Sixty-six are of the vestibule type, seating 62 and 64 passengers, and were supplied by the English Electric Co., Ltd. This type has now been adopted as the standard. A large number of the older type of car have been covered in and converted into the standard type at the car works by the staff, and conversions are being continued as opportunities arise.

### Financial Position—What a New Maximum Fare has Done.

The increase of traffic on the tramways is shown by the comparison of the returns of 1910 with those of the year ended March 31, 1930. In 1910 the miles run were 2,027,077, the passengers carried being 17,925,053, and the traffic revenue £87,420. At the end of last financial year, the mileage had increased to 3,436,894, whilst a record number of passengers—41,187,053—were carried, the revenue being £237,260.

The Department is in a sound financial position, and a special item to be noted is the capital account, which stands as follows:—

| | |
|---|---|
| Capital Outlay to date .. .. | £670,056 |
| *Less* Accumulated Sinking Funds .. | £489,888 |
| Balance outstanding .. .. | £180,168 |

As against this outstanding balance there is a sum of £106,419 in the reserve and renewals account, and it is anticipated that the time is not far distant when the whole of the capital commitments will be extinguished.

The fares and stages are on the zone system, being revised on January 1, 1924, on the basis of 1d. per mile, the stages being arranged numerically at approximately half-a-mile distance. The minimum fare is 1d., which, of course, entitles the passenger to travel two stages. A 3d. maximum was instituted in November, 1927, on the cars between the central stage in Huddersfield and any tramway terminus which, to a great extent, has been the means of retaining the patronage of the travelling public. Workpeople's return tickets are

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issued on all sections to passengers who complete the journey by 9 a.m. at ½d. above the ordinary single fare, and special privileges are given to children and scholars.

Successful developments on the tramcars and on the omnibuses are the carriage of parcels and the conveyance of letter boxes.

A notable feature is the transport of coal in special trucks on the tramways, the journey being from the railway sidings to various municipal destinations. This wscheme as inaugurated in 1904.

Alderman T. Canby, J.P.
*Chairman, Huddersfield Corporation Tramways, and President of the Municipal Tramways and Transport Association.*

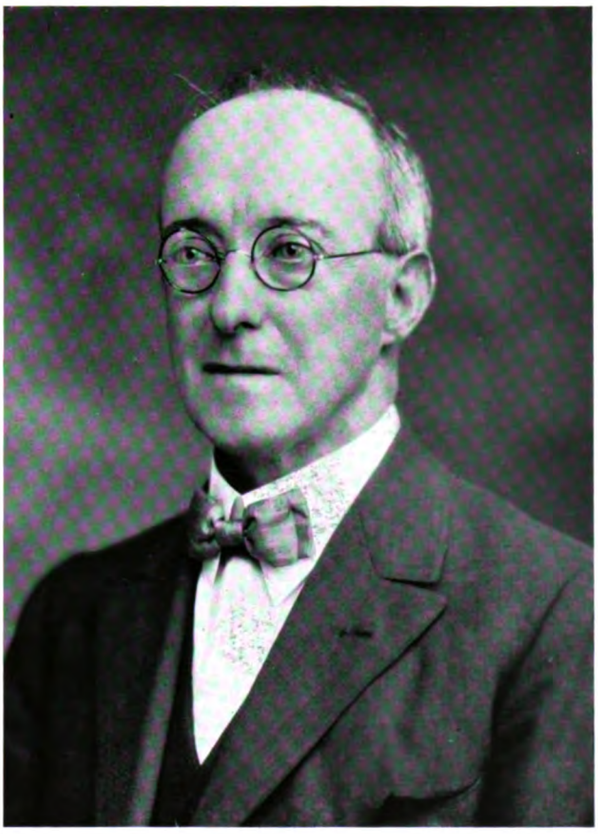
Since the opening of the car depot in St. Thomas's Road, Longroyd Bridge, on July 15, 1921, over a hundred cars can be accommodated and which is used as the general running shed, considerable improvement has taken place at Great Northern Street Car Works. These have been extended and are now equipped with the most modern plant.

### Omnibus Co-ordination Over a Large Area.

Although powers to operate motor omnibuses were obtained as far back as 1913, the World War prevented the inauguration of any services. No developments took place until 1920. Additional powers were then obtained to run omnibuses along a number of defined routes outside the borough and also with the consent of the Ministry of Transport and of the road authorities (including in the case of a main road in the West Riding of Yorkshire, the County Council) along any other road in that area.

In December, 1920, a service was instituted between Paddock Wood and Golcar, followed in March, 1921, by the Bradley-Ravensthorpe service. Additional vehicles were purchased for opening up other routes. The object of the services was primarily to link the various outlying districts with the tramway termini, but as passengers objected to having to change from one vehicle to another the department eventually decided that all the services should run into the centre of the town over the tramway routes. It has been found possible, however, to run the tramcar and omnibus services with a good measure of co-ordination, the tramway catering for the short distance and heavy traffic, whilst the omnibus services cope with the requirements of the longer distance passengers in an efficient manner.

Recognising the scope for additional services the Corporation has encouraged the department in extending omnibus facilities within and without the borough. Now there are twenty-one omnibus routes. The Huddersfield services are co-ordinated over a large area with those of Bradford, Halifax, Brighouse and Dewsbury. Communication is given with the urban districts of Farnley, Thurstonland, Golcar, Holmfirth, New Mill, Lepton, and Meltham. Services are also operated in the Colne Valley. In the borough a number of districts which have no tramways are served by omnibuses.



Alderman T. Woffenden.
*Vice-Chairman, Huddersfield Tramways Committee.*

During the early part of 1929 negotiations were entered into with the London Midland and Scottish Railway Co., and an agreement has been completed whereby the Company participates in the Corporation omnibus services on a fifty-fifty basis.

The growth of the omnibus side of the undertaking will be best appreciated from the following figures :—

| *Year ended March 31* | *Traffic Receipts* | *Miles run* | *Passengers carried* |
|---|---|---|---|
| 1922 | £9,434 | 101,644 | 749,511 |
| 1929 | £89,782 | 1,811,671 | 6,908,524 |
| 1930 | £99,130 | 2,180,240 | 8,532,763 |

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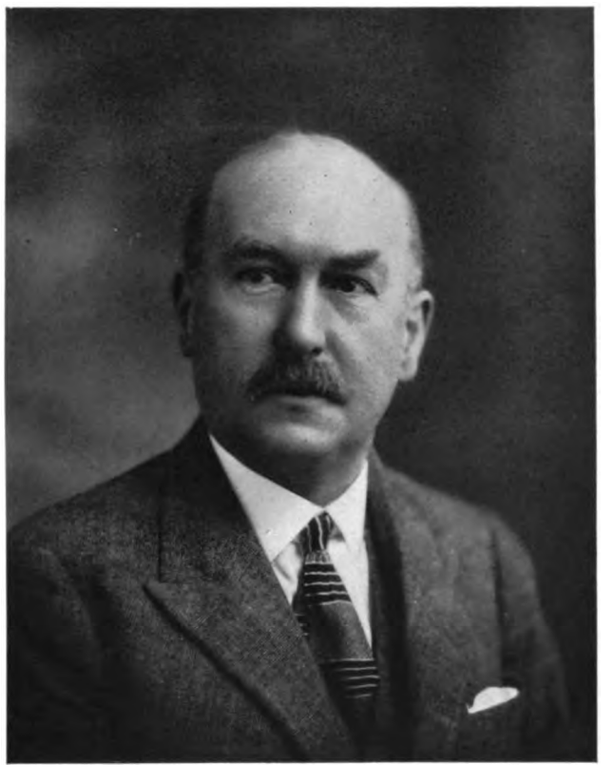
THE OMNIBUS FLEET, GARAGE AND EQUIPMENT.

Seventy-two omnibuses are in service, sixty-eight of the total having been supplied by Karrier Motors, Ltd. The remaining four are A.E.C. double-deck vehicles seating 50 passengers. Of the Karrier omnibuses only four are double-deckers. Seven single-deck machines with a seating capacity of 30–32 are on order to replace some of the 20-seat type, including the one-man operated vehicle. Despite the hills on most of the routes, the services are maintained according to the advertised schedules.

For some years the omnibuses were housed in a portion of the car works, but in September, 1928, an up-to-date garage was opened on a Corporation site adjoining the car works and Leeds Road. The plans of the buildings were prepared by the borough architect, and the department has equipped it on the most modern lines. The approximate cost has been £25,000. The floor space has an area of 4,500 yards, and is capable of accommodating nearly 100 omnibuses. In addition there is cellar space of 600 square yards. There are nine inspection pits, and all the flooring is of reinforced concrete. The building is 156 ft. wide and 30 ft. high, divided into three spans.



Mr. A. A. Blackburn.
*General Manager and Engineer.*

The garage is heated by means of hot air, the system being controlled by a gas-fed installation, the heated air being forced through into overhead tubes and distributed evenly, maintaining a regular temperature throughout the building, a great advantage in the starting up of the engines in cold weather. A further advantage is that the system displaces foul exhaust gases by the distribution of cool fresh air in the hot weather. The main entrance to the garage is from Leeds Road, whilst the exit leads into Great Northern Street, thus making a one-way traffic in and out of the building.

The outbuildings are utilised for storage of tyres and tyre repairs, battery charging plant and magneto repairs, stores and offices. Another portion of the out-building has been converted into a dining and mess room for the employees.

The omnibuses are subjected to a dock every 5,000 miles, and a complete overhaul after running 40,000 miles.

On entering the garage, the driver stops at the washing station and remains in his seat during the process of washing, then moves the vehicle to the petrol filling column and finally drives to his place in the herring-bone rank. The time taken for these operations is under ten minutes, modern methods showing how time formerly wasted can be put to good account. In washing, the high-pressure spray method is used, two cyclone B.E.N. plants being installed. A Hammond power plant, in a separate chamber, provides a 20-gallon per minute supply of petrol at each of the three metering columns situated at convenient points inside the garage. Under the floor of the garage there are three petrol tanks, each with a capacity of 5,000 gallons. In addition there are three underground tanks, each with a capacity of 500 gallons, for storing engine oil, gear oil and paraffin. A Luchard air compressor is used for inflating tyres, whilst for re-claiming oil taken out of the engine sumps, a Fox's 5-gallon electric heated oil cleaner has been obtained. For replenishing the omnibuses with petrol whilst in service, the department owns a motor vehicle on which is mounted a 200-gallon Bowser tank.

Practically the whole of the fleet, garage and equipment have been purchased out of revenue during the past nine years, with the result that a net debt of only £1,218 stands against the capital account.

The Tramways Committee comprises :—*The Mayor* (Alderman Walker T. Priest, J.P.) ; *Chairman*—Alderman Thomas Canby, J.P. (Deputy-Mayor) ; and *Deputy-Chairman*—Alderman T. Woffenden ; *Members* —Alderman R. Mitchell, J.P., Councillors J. Barlow, L. Denham, A. Gardiner, C. H. Moxon, W. Scott, A. E. Sellers, T. Taylor, H. Vickerman, and H. S. Walker.

Mr. A. A. Blackburn has been general manager and engineer of the undertaking since December, 1918. His predecessor was Mr. R. H. Wilkinson, who was appointed to Bradford upon the appointment of Mr. C. J. Spencer as general manager of the tramways of the London Underground Group.

The staff and employees number 842. They work in harmonious relationship with the management, which attributes to their co-operation, and to the sound policy of the present and past Committees, the fact that the undertaking has become so valuable an asset to the ratepayers.

We are indebted to the courtesy of Mr. Blackburn for much of the information contained in this article.

## LONDON PASSENGER TRAFFIC.

The London County Council's Special Committee on Traffic has prepared a report on passenger traffic in the Greater London Area for the year 1929 and the two preceding years. It is shown that the total number of passenger journeys in 1929 was 3,950 millions, a daily average (on the basis of 365 days) of over 10½ million journeys. The population of Greater London in 1929 was estimated at 7,850,570, and the number of journeys, therefore, was equivalent to 503 for each man, woman and child in the year, or an average for inhabitants of all ages of 1⅓ journeys a head a day.

Tramways still carry over 1,000 million passengers a year. Railways carry less than one-fourth of the total.

The increase in the combined figures for 1929 over 1928, is 1.3 per cent. The increase was greatest on the railways, and of these, the highest ratio of increase was on the tube railways.

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## MUNICIPAL TRAMWAYS AND TRANSPORT ASSOCIATION.

PROGRAMME OF ANNUAL CONFERENCE.

The annual conference of the Municipal Tramways and Transport Association, as previously announced, will be held at Harrogate on September 24, 25 and 26. The complete programme is as follows:—

TUESDAY, SEPTEMBER 23.

8.30 p.m. Informal reception at the Spa Rooms, Harrogate, by the Mayor of Harrogate (Alderman Richard Annakin) and the Mayoress (Mrs. Annakin) and the President of the Association (Alderman Thomas Canby, J.P.) and the President's daughter (Mrs. J. Hirst). Followed by a dance and entertainment.

WEDNESDAY, SEPTEMBER 24.

9.30 a.m. Meeting of the Council of the Association at the Hotel Majestic.

10.0 a.m. CIVIC WELCOME at the Hotel Majestic by the Mayor of Harrogate.
PRESIDENTIAL ADDRESS by Alderman Thomas Canby, Chairman of the Huddersfield Corporation Tramways Committee.
Presentation of cheques and medals to prize-winners in the Essay Competition, 1930.
GENERAL MEETING of the Association.

1.0 p.m. Luncheon (members to make their own arrangements).

2.30 p.m. PAPER by Councillor A. H. Gledhill, J.P., Chairman of the Halifax Corporation Tramways Committee on "The Transition of Transport between 1928 and 1930." Discussion to follow.

5.0 p.m. Adjournment.

7.30 p.m. Annual Dinner of the Association at the Hotel Majestic. Dance to follow.

THURSDAY, SEPTEMBER, 25.

9.30 a.m. Meeting of the Council of the Association at the Hotel Majestic.

9.45 a.m. Meeting of the Managers' Section.
A report on the subject of Petrol Prices will be submitted.

10.15 a.m. Conference resumes. Discussion on Councillor Gledhill's paper.

12.45 p.m. Luncheon (members to make their own arrangements).

1.45 p.m. Official photograph in the grounds of the Hotel Majestic.

2.30 p.m. PAPER by Mr. W. Vane Morland, General Manager of Tramways and Motors, Walsall, on "The Progress made with the Development of the Heavy Oil Engine." Discussion to follow.

FRIDAY, SEPTEMBER 26.

10.0 a.m. Motor coaches start from the Hotel Majestic for Huddersfield.

12.45 p.m. Luncheon at the Guildhall, Huddersfield, at the invitation of the Mayor (Alderman Walker T. Priest, J.P.) and the Chairman, Vice-Chairman and members of the Huddersfield Corporation Tramways Committee.

2.30 p.m. Motor coaches will leave Huddersfield for Temple Newsam, Leeds, where members will be the guests at tea of the Leeds City Tramways and Transport Committee.

7.30 p.m. Arrive in Harrogate.

A special programme for the ladies only has been prepared, containing full particulars of the arrangements made for visiting places of interest.

The headquarters will be the Hotel Majestic.

The Council have decided, as announced in our issue of August 16, that there will be no omnibus demonstration at the conference.

## BUENOS AIRES UNDERGROUND RAILWAY.

Buenos Aires New Underground Railway is expected to be opened for traffic shortly. The line, which is 5½ miles long, runs from Buenos Aires Central Railway terminus to Callao. The first section of 4½ miles cost about £4,000,000. Fifty-six cars, which have been constructed by the Metropolitan-Cammell Carriage Wagon and Finance Co., will be delivered shortly. Each car is equipped with motors.

It is reported by the local correspondent of the "Electrical Review" that the municipality of Buenos Aires has approved of a scheme submitted by the Compania Anonima de Projectos y Construcciones de Madrid for an extension of the underground electric railways. A later cabled report states that the scheme has been approved of by the Deliberative Council, although the Intendente had pronounced against it.

## INTERNATIONAL TRAMWAYS UNION.

REPORTS ON REGENERATIVE CONTROL TO SPECIAL MEETING IN PARIS.

The President of the International Union of Tramways, Light Railways and Public Automobile Transport, Mr. Frederic de Lancker, has issued a notice to members on behalf of the Council, with reference to a meeting to be held in Paris towards the end of October. M. André Mariage, vice-president of the International Tramways and Light Railways Union, president and managing-director of the Paris Public Transport Co., after the discussion of the subject of regenerative compound motors at the recent Congress at Warsaw, offered to arrange for a special meeting in Paris and to show to those interested in the question the results obtained from the working by the Paris Company of regenerative motors such as were designed by M. Bacqueyrisse, general manager and chief of the technical department of the company.

M. Mariage has now suggested for the proposed meeting two days during the week October 20 to 26, very probably the 20th and 21st. The exact dates will be fixed later. The Council have extended an invitation to the members of the Union, and express the hope that many members will attend this demonstration, as the results to be given of the economic results obtained by this system of regeneration will be of much interest and importance to all tramway operators.

The French delegates propose to arrange a reception to which ladies accompanying members are invited. Members are requested to notify their acceptance of the invitation by September 15. Communications should be addressed to M. A. de Backer, secretary-general, 112, Rue du Trone, Brussels.

## LONDON TUBE EXTENSION CONTRACTS.

Some of the contracts in connection with the extension and improvement of the London tube railways have now been placed. That for the construction of the tunnel section of the Piccadilly tube extension from Finsbury Park to Southgate has been given to Messrs. Charles Brand & Son, of Millbank House, Westminster, London, S.W. Contracts for cast-iron segments, costing £20,000, have been placed in the north of England. This extension will be about 4½ miles, and a further section of three miles to Cockfosters is part of the scheme, but contracts for this, which is above ground, have not yet been placed. The extension at the southern end from Hammersmith to Northfields will be undertaken later in the year.

In connection with these extensions and the reconstruction of stations in central London, including Leicester Square, Dover Street, Hyde Park Corner, Knightsbridge, Marble Arch, Warren Street and Holborn, about fifty escalators will be required. The contracts for these have been awarded to Waygood-Otis, Ltd.

## ADELAIDE MUNICIPAL TRAMWAYS TRUST.

The statement of accounts of the Adelaide Municipal Tramways Trust for the forty-sixth half-year ended January 31, 1930, shows that the revenue amounted to £450,616, and the total operating expenses to £372,942, leaving a balance of £77,673. The following appropriations were required:—Interest, £94,417; sinking fund, £16,304; reserve for renewals, £23,139. There is thus a shortage for the six months of £56,198. Of this amount £34,743 was due to a loss on the motor omnibus service. The undertaking has reserves secured from revenue of £1,151,455. On the Adelaide electric tramways system, after 21 years, after payment of full interest on construction, and providing £754,999 by way of sinking fund, there is a surplus to date of £88,022. On the Port Adelaide electric system after nearly thirteen years, there is a shortage of provision under the Tramways Act of £135,209. On the motor omnibus service the shortages to date amount to £134,248.

Fares were increased throughout the system on November 3, 1929, and are now similar to the fares on the tramways of the Melbourne Metropolitan Trust. As from January, 1930, monthly periodical tickets covering four or more sections have been issued. The operating expenses per traffic mile on the Adelaide tramways were 16·794d., and the revenue 23·659d.; on the Port Adelaide system the expenses were 15·811d., revenue 17·297d.; on the single-deck omnibuses, expenses 11·475d., revenue 10·538d.; and on the double-deck omnibuses, expenses 23·431d., revenue 15·10d. Omnibus mileage amounted to 1,656,225 and the passengers carried totalled 3,614,920.

The members of the Tramways Trust and the principal officers are as follows:—E. H. Bakewell (*chairman*), Charles R. J. Glover, Jas. L. Leal, W. A. Norman, J. S. Rees, Chas. M. Reid, J. W. Wainwright, E. Geo. Whittle. *Chief Engineer and General Manager* W. G. T. Goodman, M.Inst.C.E., M.I.E.E., etc.; *Secretary and Assistant Manager*—Chas. R. Moyes, A.C.U.A., F.A.I.S.; *Accountant* C. A. Smith, A.C.U.A., F.A.I.S.

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## GLASGOW CORPORATION TRANSPORT.

### A Record of Successful Enterprise.

One cannot study the facts and figures of the Glasgow Corporation Transport accounts for the year ended May 31 last without experiencing a feeling of admiration. Voluminous and clear, they show a consistent record of success and enterprise. The drag on the undertaking is the subway, which was re-opened by the Corporation in July, 1922, but so far has not proved a paying proposition. This very interesting report is signed by Councillor P. J. Dollan, Convener of the Transport Committee, and Bailie J. H. Stevenson, Sub-Convener. The Committee and the General Manager, Mr. Lachlan Mackinnon, are to be congratulated on the strong financial position of such a large and responsible undertaking.

In the table headed "Financial Summary from 1st June, 1901, to 31st May, 1930," which we reproduce, column 10 shows a net profit on the transport system year after year. The total capital outlay up to May 31 was £8,019,743; of this the tramways accounted for £7,192,987, the omnibuses £421,237, and the subway £405,519. The loan debt stood at £3,388,060, but against this the depreciation and renewals fund reached the huge total of £3,387,992, and with £91,732 in general reserve and other funds, there was a surplus of £91,664. Since the Corporation began to operate the system in 1894–5 it has paid the Common Good Fund £1,216,504, to city and county rates £2,718,144, and in property and income tax £1,126,662. During the past ten years it has also paid in road maintenance and assessments sums aggregating £3,569,863. The department carries its own third-party risk, and the balance at May 31 was £76,140; claims and other expenses during the year amounted to £44,167, and £40,060 was credited to the fund.

At May 31 the department employed a staff of 8,624, being 574 more than at the same period of 1929. Of this total 7,379 were on the tramways, 855 on the omnibuses, and 390 on the subway. The wages for the year totalled £1,337,836. Motormen and conductors are paid 56s. per week, rising gradually to 64s. in their fifth year. Omnibus drivers start at 60s. per week and advance by 2s. stages each year to 66s., the scale for omnibus conductors being 55s., advancing to 60s.

As a sidelight on the transport undertaking, the record of articles found is interesting. Glasgow seems to have the usual proportion of absent-minded folk, for these accounts show that on the three systems 61,847 articles were found, 12,144 of them being umbrellas. There would seem also to be some indifference to such losses, for 31,078 articles remained unclaimed. While umbrellas are by far the most common articles left on the tramcars and omnibuses, on the subway sums of money and purses predominate.

#### Tramway Results.

Taking the accounts of the three systems separately, the total borrowing powers of the tramways is £8,263,266, of which at May 31 £7,708,113 had been borrowed, leaving an unexhausted balance of £555,154. The capital expenditure was £7,192,987. The following table shows the results of the past year compared with the previous year:—

| | For the year ended May 31. | |
|---|---|---|
| | 1928–9. | 1929–30. |
| Total Revenue | £2,284,890 | £2,317,627 |
| Working Expenses | £1,681,008 | £1,689,035 |
| Route Miles of Line Open (double 133.327, single 4.270) | 137.01 | 137.60 |
| Car Miles | 35,205,074 | 35,867,856 |
| Car Hours | 3,892,207 | 3,882,334 |
| Passengers Carried | 458,865,001 | 470,020,925 |
| Units Used | 69,968,335 | 79,049,629 |
| Population Served | 1,512,297 | 1,526,000 |

Deducting the expenses from the revenue left a balance of £628,592. Adding interest on investments (£130,314) brought this to £758,906, from which the following sums were subtracted:—

| | |
|---|---|
| Interest | £135,159 |
| Sinking Fund | 774,754 |
| Income Tax | 77,581 |
| Parliamentary Expenses | 356 |
| Depreciation Fund | 212,782 |
| Permanent Way Renewals Fund | 250,138 |
| | £750,770 |

This left a surplus of £8,136, but a deficit on the subway section of £25,277 converted the tramway profit into a loss of £17,141.

The total length of the tramways is 270⅞ miles, single track, of which 178 miles are in the city boundaries, 45 miles in the adjoining burghs, and 47 miles in the counties of Lanark, Renfrew, and Dumbarton. During the year £250,138 was set aside out of the year's revenue for renewal of track, calculated at £900 per mile, and £130,844 was spent in ordinary repairs to the track. The number of cars in stock at the end of the financial year was 1,135, besides 135 sundry vehicles, and the average number in use was 818; they cost £205,011 for inspection and repairs. During the year 243 cars were reconditioned and another 209 were fitted with upper deck vestibules. The power station consumed 96,534 tons of coal costing £69,880, an average of 14s. 5¾d. per ton.

The following table shows the averages, etc., of the last two financial years:—

| Tramway Averages. | For the Year ended May 31. | |
|---|---|---|
| | 1928–9. | 1929–30. |
| Per Mile of Single Track— | | |
| Population Served | 5,632 | 5,641 |
| Car Miles | 131,118 | 132,598 |
| Passengers | 1,708,994 | 1,737,600 |
| Traffic Revenue | £8,491 | £8,550 |
| Valuation (Lines and Depots) | £1,274 | £1,345 |
| Valuation (Lines Only) | £1,038 | £1,110 |
| Per Route Mile— | | |
| Traffic Revenue | £16,640 | £16,808 |
| Per Car Mile— | | |
| Units Used | 1.99 | 2.20 |
| Traffic Revenue | 15.543d. | 15.475d. |
| Total Revenue | 15.577d. | 15.508d. |
| Working Expenses | 11.480d. | 11.302d. |
| Working Expenses (Excluding Power Works) | 10.712d. | 10.468d. |
| Working Expenses (Plus Permanent Way Renewals) | 12.306d. | 12.207d. |
| Passengers | 13.03 | 13.10 |
| Per Passenger— | | |
| Fare Paid | 1.192d. | 1.181d. |
| Working Expenses | .881d. | .862d. |
| Debt Charges | .096d. | .107d. |
| Depreciation and Renewals | .282d. | .236d. |
| Per Annum per Head of Population— | | |
| Traffic Revenue | 30s. 2d. | 30s. 4d. |
| Journeys | 303 | 308 |

Of last year's passengers 24.81 per cent. were ½d. fares, 32.57 per cent. 1d. fares, 24.69 per cent. 1½d. fares, and 17.93 per cent. 2d. and over. An impressing array of figures is shown by taking some of the totals of the 36 years from 1894–5 to 1929–30. These show a car mileage of 778,046,651, passengers numbering 10,616,934,990, and a traffic revenue of £45,181,742, with an average traffic revenue per car mile over the 36 years of 13.94d., an average revenue per passenger of 1.02d., and an average number of passengers per car mile of 13.65.

#### The Omnibuses.

On December 8, 1924, the Corporation inaugurated their omnibus services. Since then the total capital expenditure to May 31 last has been £421,237. The total revenue for the past year was £349,736, compared with £185,330 in the previous year, and the working expenses were £272,281, compared with £133,185. Thus there was a balance for the past year of £77,456, and after deducting £75,893 for interest (£9,726), sinking fund (£5,185), and depreciation (£60,982), there was a net balance of £1,563.

The following is a summary of information and averages for the past two years:—

| Omnibuses. | For the Year ended May 31. | |
|---|---|---|
| | 1928–9. | 1929–30. |
| Total Revenue per Omnibus Mile | 14.482d. | 15.066d. |
| Traffic Revenue per Omnibus Mile | 14.476d. | 15.060d. |
| Fare paid per Passenger | 1.763d. | 1.744d. |
| Miles paid for per Passenger | 2.31 | 2.383 |
| Operating Expenses per Omnibus Mile— | | |
| Traffic | 4.148d. | 4.390d. |
| General | .665d. | .865d. |
| Licences per Omnibus Mile | .617d. | .537d. |
| Repairs and Maintenance | 2.018d. | 2.689d. |
| Fuel | 2.829d. | 3.079d. |
| Miscellaneous | .130d. | .181d. |
| Total | 10.407d. | 11.741d. |
| Percentage of Expenses to Revenue | 71.89% | 77.97% |
| Length of Route (miles) | 51.41 | 87.90 |
| Total Omnibus Miles Run | 3,071,393 | 5,565,616 |
| Omnibus Miles per Day per Omnibus | 145.13 | 142.10 |
| Omnibus Hours | 287,424 | 506,776 |
| Omnibus Hours per Day per Omnibus | 787 | 1,388 |
| Speed per Hour (miles) | 10.69 | 10.98 |
| Number of Omnibuses in Stock | 129 | 201 |
| Passengers Carried | 25,220,710 | 48,066,753 |
| Passengers per Omnibus Mile | 8.211 | 8.636 |
| Distance of 1d. Fare (miles) | —— | 1.15 |
| Fare Charged per Mile | —— | .621d. |

The number of omnibuses in stock at May 31 was 201, and of the last 100 ordered 38 had still to be delivered by the makers. The cost of maintenance during the year was £59,117. Three new routes were opened during the year, a new paint shop was erected at Larkfield Garage, and the garage itself is now being extended. Omnibus fares were reduced on March 2. A table shows that 36.47 per cent. of the passengers had penny fares, representing 20.92 per cent. of the revenue, and that while 17.31 per cent. of passengers represented 2½d. fares they contributed 24.82 per cent. of the revenue.

(*Continued on page* 142).

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# GLASGOW CORPORATION TRANSPORT.

## FINANCIAL SUMMARY from 1st June, 1901, to 31st MAY, 1930.

*Reproduced from the official report for the year ended May 31, 1930.*

| Year ended 31st May. | Mileage Open (single track). | Car Mileage. | Income †(excluding Subway and Buses). | Working Expenses †(including Loss on Subway and Buses, if any). | Gross Profit. | Net Revenue Account. Loan Charges. | Net Revenue Account. Income Tax. | Net Revenue Account. Total of Cols. 7 and 8. | Net Profit. | Depreciation and Renewals. | Reserve. | Common Good. | Net Loan Debt at 31st May †(including Subway and Buses). | Depreciation and Renewals Fund. Balance at 31st May. | Total Capital Outlay to 31st May (including Subway and Buses). | Year ended 31st May. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) |
| | Miles. | | | | | | | | | | | | | | | |
| 1902 | 103½ | 12,615,021 | £614,413 | £294,447 | £319,966 | £91,258 | £3,757 | £95,015 | £224,951 | £111,956 | **£100,495** | £12,500 | £1,884,606 | £190,012 | £2,347,174 | 1902 |
| 3 | 130 | 14,008.750 | 656,572 | 307,855 | 348,717 | 104,366 | 1,519 | 105,885 | 242,832 | 192,555 | 25,277 | 25,000 | 1,889.312 | 380,067 | 2,574,260 | 3 |
| 4 | 140 | 16,291,082 | 724,851 | 374,753 | 350,098 | 104,861 | — | 104,861 | 245,237 | 201,447 | 18,790 | 25,000 | 1,830,894 | 570,567 | 2,686,911 | 4 |
| 5 | 147½ | 17,943,595 | 767,904 | 394,054 | 373,850 | 96,826 | 5,434 | 102,260 | 271,590 | 221,792 | 24,798 | 25,000 | 1,783,084 | 777,637 | 2,763,382 | 5 |
| 6 | 160¾ | 18,886,910 | 825,684 | 468,843 | 356,841 | 103,114 | 12,422 | 115,536 | 241,305 | 169,887 | 36,418 | 35,000 | 1,731,899 | 905,254 | 2,971,349 | 6 |
| 7 | 176¼ | 20,350,367 | 899,352 | 502,187 | 397,165 | 113,546 | 9,932 | 123,478 | 273,687 | 213,408 | 25,279 | 35,000 | 1,679,974 | 1,079,253 | 3,104,061 | 7 |
| 8 | 179 | 20,766,722 | 916,565 | 522,640 | 393,925 | 121,956 | 9,436 | 131,392 | 262,533 | 192,664 | 34,869 | [1]50,000 | 2,483,049 | 1,224,051 | 3,145,576 | 8 |
| 9 | 189½ | 20,802,797 | 922,542 | 515,351 | 407,191 | 134,673 | 10,445 | 145,118 | 262,073 | 195,798 | 16,275 | 50,000 | 2,434,479 | 1,383,289 | 3,307,280 | 9 |
| 1910 | 195⅛ | 20,974,016 | 934,459 | 514,465 | 419,994 | 157,375 | 15,985 | 173,360 | 246,634 | 193,606 | — | 53,028 | 2,534,688 | 1,537,642 | 3,424,728 | 1910 |
| 1 | 196½ | 21,704,237 | 992,932 | 543,221 | 449,711 | 164,962 | 13,492 | 178,454 | 271,257 | 202,579 | — | 68,678 | 2,562,341 | 1,702,915 | 3,503,174 | 1 |
| 2 | 196⅝ | 22,435,076 | 1,040,847 | 593,092 | 447,755 | 168,956 | 13,027 | 181,983 | 265,772 | 213,704 | — | 52,068 | 2,546,923 | 1,873,247 | 3,532,736 | 2 |
| 3 | 196¾ | 23,335,008 | 1,070,175 | 629,176 | 440,999 | 178,851 | 13,388 | 192,239 | 248,760 | 215,757 | — | 33,003 | 2,479,408 | 2,040,283 | 3,694,143 | 3 |
| 4 | 196⅞ | 24,403,482 | 1,148,836 | 682,717 | 466,119 | 185,528 | 14,057 | 199,585 | 266,534 | 212,642 | — | 53,892 | 2,517,360 | 2,158,739 | 3,675,317 | 4 |
| 5 | 198⅛ | 24,214,460 | 1,142,705 | 750,364 | 392,341 | 184,289 | 22,790 | 207,079 | 185,262 | 172,310 | — | 12,952 | 2,411,868 | 2,294,305 | 3,751,708 | 5 |
| 6 | 198¼ | 24,963,309 | 1,238,540 | 780,643 | 457,897 | 200,088 | 39,854 | 239,942 | 217,955 | 174,407 | — | 43,548 | 2,359,819 | 2,447,945 | 3,835,157 | 6 |
| 7 | 198¼ | 25,786,047 | 1,338,752 | 846,616 | 492,136 | 193,224 | 64,623 | 257,847 | 234,289 | 73,305 | — | 160,984 | [2] — | 181,200 | 3,846,455 | 7 |
| 8 | 198¼ | 26,261,231 | 1,421,215 | 1,055,363 | 365,852 | — | 64,405 | 64,405 | 301,447 | 123,894 | — | **177,553** | [2] — | 297,413 | 3,862,934 | 8 |
| 9 | 198¼ | 25,581,547 | 1,541,885 | 1,259,867 | 282,018 | — | **83,702** | 83,702 | 198,316 | 183,543 | — | 14,773 | [2] — | 449,006 | 3,880,300 | 9 |
| 1920 | 198⅛ | 26,459,015 | 1,734,923 | 1,570,310 | 164,613 | 5,607 | 81,295 | 86,902 | 77,711 | 186,242 | — | [3]108,531 | 43,428 | 471,585 | 3,966,316 | 1920 |
| 1 | 198 | 26,902,874 | 2,408,094 | **1,954,198** | 453,896 | 9,600 | 70,813 | 80,413 | 373,483 | 267,687 | — | [4]105,796 | 126,770 | 470,804 | 4,054,892 | 1 |
| 2 | 200⅛ | 27,024,529 | 2,354,294 | 1,820,855 | 533,439 | 15,831 | 55,534 | 71,365 | 462,074 | 309,350 | — | [5]152,724 | 449,084 | 466,472 | 4,646,177 | 2 |
| 3 | 209¾ | 26,957,721 | 2,267,853 | 1,627,410 | 640,443 | 41,407 | 40,188 | 81,595 | 558,848 | 538,770 | — | 20,078 | 952,093 | 782,511 | 5,296,552 | 3 |
| 4 | 252⅞ | 29,645,098 | 2,325,736 | 1,702,795 | 622,941 | 69,773 | 40,481 | 110,254 | 512,687 | 463,488 | — | 49,199 | 1,574,151 | 1,072,424 | 6,413,275 | 4 |
| 5 | 264¾ | 30,937,136 | 2,380,408 | 1,772,727 | 607,681 | 121,951 | 75,931 | 197,882 | 409,799 | 490,075 | — | [3] 80,276 | 2,469,488 | 1,398,199 | 6,904,545 | 5 |
| 6 | 265⅜ | 32,058,534 | 2,313,441 | 1,689,499 | 623,942 | 155,555 | 79,486 | 235,041 | 388,901 | 526,752 | — | [3]137,581 | 2,896,111 | 1,839,789 | 7,070,968 | 6 |
| 7 | 266⅜ | 33,564,569 | 2,420,227 | 1,721,907 | 698.320 | 176,096 | 68,536 | 244,632 | 453,688 | 532,320 | — | [3] 78,632 | 2,992,619 | 2,277,639 | 7,156,829 | 7 |
| 8 | 266⅞ | 34,789,110 | **2,471,804** | 1,682,587 | **789,217** | 172,673 | 56,322 | 228,995 | **560,222** | **540,468** | — | [6] 19,754 | 3,004,752 | 2,703,219 | 7,292,231 | 8 |
| 9 | 269⅝ | 35,205,074 | 2,387,926 | 1,703,598 | 684,328 | 184,253 | 66,163 | 250,416 | 433,912 | 538,525 | — | [3]104,613 | 3,061,595 | 3,085,152 | 7,708,113 | 9 |
| 1930 | **270⅞** | **35,867,856** | 2,447,941 | 1,714,668 | 733,273 | **209,913** | 77,581 | **287,494** | 445,779 | 462,920 | — | [3] 17,141 | **3,388,060** | **3,387,992** | **8,019,743** | 1930 |

1 Includes £15,000 transferred from General Reserve Fund.

2 Balance of Debt paid off by means of Depreciation and Renewals Fund.

3 Deficiency for year was carried forward.

4 Applied in Liquidation of Loss on previous year.

5 Applied in Liquidation of Loss £2,735, and £149,989 paid to Common Good.

6 Applied to Outstanding Deficit.

† Subway re-opened under Corporation, July, 1922, and Motor Buses inaugurated 8th December, 1924.

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The Glasgow Subway became the property of the Corporation on August 1, 1923, for the sum of £381,590, and the capital expenditure at May 31 was £405,518. Revenue for the past year totalled £93,150, and working expenses £94,139, leaving a debit balance of £989. To the income has to be added £2,991 in rents from properties let, but after charging interest and sinking fund the deficit amounted to £25,277. It has a mileage of 6.55 on the inner circle and 6.57 on the outer circle. The car miles run totalled 1,172,587, and passengers numbered 19,969,185. Rolling-stock comprises 50 cars and one electric locomotive.

## ROAD PASSENGER TRANSPORT.

MR. R. STUART PILCHER'S NEW BOOK.

In a preface to a volume which he has written for Pitman's transport library, Mr. R. Stuart Pilcher, general manager, Manchester Corporation Tramways, says that the book is the outcome of an invitation "to write some notes on road transport systems that might be useful to students who wish to obtain a general knowledge of the subject." The book will appeal, however, to a wider circle than that for which it has been written.

Mr. Pilcher opens with eleven pages on the importance of transport to the community, and in a reference to roads he observes that some of the larger Corporations are building roads 120 ft. in width, with a separate track for tramways. The next three chapters relate to cable tramways, the electric conduit system, and electric self-propelled vehicles. Mr. Pilcher was appointed general manager at Edinburgh in order to convert the cable tramways to overhead electric traction. The change of system greatly assisted the prosperity and development of the city. In setting forth the advantages and disadvantages of the trolleybus, the author can find only one drawback, namely that the overhead wires prevent its use for miscellaneous purposes in the same manner as a motor omnibus. The electric trolley system takes up fifty-five pages, and is made the more interesting by references to, among other things, recent developments in controllers, brakes, light-weight equipments, car furnishing, speeds, scrapping old equipments, noise reduction, cleaning of cars, the training of motormen, and the advance in the methods of rail welding.

Mr. Pilcher retains his predilection for the modern single-truck car, which owes some of its improvement to the encouragement he has given to its use and his readiness to improve older models. Single trucks, he says, can be supplied capable of taking a curve with a radius of 35 ft., and suitable for speeds up to 30 M.P.H., quiet and smooth in running and free from jazzing or galloping. An improved method of suspension provides for a certain amount of play when taking curves and prevents excessive wear on the wheel flanges and on the points, also reducing the noise. The latter achievement is one upon which Mr. Pilcher is very keen at Manchester. He further commends the single truck as being cheaper and less destructive to the track. It is not, he says, so noisy as the double bogie car, but it may not have such good riding qualities. Commendation of modern light-weight traction motors is accompanied by some technical data concerning four typical motors.

Light-weight motors give double the horse-power for the same weight as the old motors, and this policy of weight reduction has been generally applied to all the under-carriage of the electric car. For a single truck car this gives a reduction from 11½ tons to 9½ tons, with a material lessening of the cost of operation and the cost of track maintenance. Referring to the importance of cars being made attractive by painting and varnishing every twelve or eighteen months, and comfortable internally with transverse upholstered seats, the author says that the public demand the best in seats, and they will travel on those vehicles which give the greatest comfort or even luxury, since they are willing to pay for it. On the question of speeds there is a reference to the Ministry of Transport having authorised speeds up to 24 M.P.H. on sleeper track. Modern motors are designed to give a speed of 30 M.P.H. on the level, and Mr. Pilcher sees no objection to higher speeds so long as the cars are fitted with modern equipment and efficient brakes, and the tracks are maintained in first-class condition.

More than ordinary interest is attached to the twenty-four pages on the motor omnibus, bearing in mind the author's success in inducing Manchester to replace single-track tramways and single-deck tramcars with modern double-deck omnibuses, and otherwise extending the use of omnibuses. There is much that is instructive to the operator in this chapter. Remarking that the low-loading vehicle has caught the public mind, with the result that the older type of omnibus has become obsolete before it is worn out, Mr. Pilcher finds that a low-loading omnibus will earn considerably more revenue than a vehicle of the older type, so that scrapping of the latter is a profitable proceeding. One hint given by Mr. Pilcher relates to the value of compulsory lectures for improving the efficiency of drivers. "There still appears," the author says, "to be room for improvement in the carburettor, as is evidently appreciated by the vendors of the many inventions for improving petrol consumption, removing carbon, etc." Some present-day petrols are referred to as containing a large proportion of heavy spirit, resulting in crank-case dilution, which has not previously been serious in this country. Some makers are fitting oil rectifiers to their engines to eliminate diluent from oil. Important observations are made concerning lubrication, chassis, tyres, lighting, body work, the overhaul department, smell, noise, garage accommodation, and the various useful machines and plant known as shop appliances.

In the five pages devoted to operating costs, advantages and disadvantages of the omnibus, express services, area control, and long-distance services, Mr. Pilcher touches upon several problems that face the transport manager. Instructive chapters are those dealing with the management of private and municipal undertakings, wages, hours and working conditions, the National Joint Industrial Council, works committees, suggestion committees, and co-ordination of road passenger transport in the provinces and in London, together with information concerning the steps taken in the same direction in Germany and the United States. Transport managers will be interested in the concluding chapter. It gives the author's experience of piecework in the shops and the permanent-way department as a means of raising wages and reducing the costs of production.

* Road Transport Operation—Passenger, by R. Stuart Pilcher, F.R.S.E., M.Inst.I. (209 pp. 5 in. by 8½ in.). Sir Isaac Pitman and Sons, Ltd. 10s. 6d. net.

## CORRESPONDENCE.

THE HARD CASE OF THE TORQUAY TRAMWAYS COMPANY.

*To the Editor of* THE TRAMWAY AND RAILWAY WORLD.

SIR.—At the request of the Torquay Corporation, my company promoted a Bill last Session to authorise the substitution of the trolley vehicle system for the existing tramway. It was a Certified Bill—in other words, a Bill authorising works which would provide immediate employment.

The Bill came before a Select Committee of the House of Lords. It was opposed by the Devon County Council and the Paignton U.D.C. on points of detail only. It was also opposed by a recently formed association called the Torquay Citizens' League, on the grounds that the ratepayers' right of purchase of the tramway undertaking had been deferred without consulting the ratepayers.

Evidence was heard for and against, occupying three days, and the Bill was passed. It was opposed in the House of Commons, and in due course was passed by the Unopposed Committee. The Citizens' League managed to get the Bill objected to by Labour members and the Labour Party voting solidly against the Bill it was rejected. It was obvious that the members who spoke in support of the rejection had no knowledge of the facts. The first speaker stated that there was no provision made for facilities for workmen. That was untrue. The second speaker stated that the company would get larger fares than those at present allowed by the Tramway Act. That was also untrue. The Bill provided for reduced fares.

It was evident, however, in view of the case put up for the rejection, that there was some other motive, and I have before me a copy of a paper called "The Post," the organ of the Union of Post Office Workers, issued on July 19, in which the following article by Mr. George Middleton, M.P., the editor, appears:—

> "To go back to the beginning of the week. We had relief from the seemingly everlasting Finance Bill in the shape of the Torquay and Paignton Traffic Bill. The rejection of the Bill was moved by Mr. McKinlay, a Glasgow Labour member, and not only he, but many others, took a delight in creating difficulties for Torquay as a fitting punishment for the folly of the citizens in sending Commander Williams to represent the town—the member who now is known as "Talk-ee Williams." The Minister of Transport, Mr. Herbert Morrison, made it clear that the passing of the Bill was likely to be prejudiced by the part played in the House by Torquay's member. When the division was taken it was seen that the promoters of the Bill were heavily defeated. There was a good deal of satisfaction in certain quarters that the House had got even with the arch-obstructionist of the Opposition."

If the reason given by so high an authority as Mr. Middleton is correct, the Labour Party have upset the invariable Parliamentary practice, and have deliberately prevented immediate work to a large number of unemployed in Torquay in order to vent their vengeance on a member of Parliament with whose habits they do not happen to agree.—Yours faithfully,

W. B. COWNIE,
Managing Director,
Torquay Tramways Co., Ltd.

Salisbury Square House,
Salisbury Square, London, E.C.4.
August 28, 1930.

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# TRAMWAY AND LIGHT RAILWAY NOTES.

## ABERDEEN.

A Record Year for the Tramways.

At the annual inspection of the transport undertaking on August 19, Mr. J. L. Gunn, the general manager and engineer announced that the tramways had concluded a record year in the history of the undertaking. Passengers had increased by 3,750,000. He had seen about fifty municipal accounts for the past year, and in working expenses Aberdeen, so far, came out second. The report, since issued, shows that the revenue was £167,637, an increase of £5,672, and working expenses £134,691, an increase of £3,148.

## ACCRINGTON.

Cost of Road Reinstatement.

A report submitted by the Borough Treasurer to the Corporation Transport Committee estimates that the total cost of reinstating the roadways on the Accrington tramways will be £11,519. The estimate is based on the amount named by Lancashire County Council for the Manchester Road section. Deducting the estimated scrap value of the rails, the net cost of the reinstatement will be £9,022. The liabilities attaching to the tramways system at March 31 are therefore: Outstanding debt, £37,941; reinstatement of roads, £9,022; total £46,963. The amount standing to the credit of the depreciation and renewals fund on March 31 was £58,948, so that the department has a surplus of £12,000.

## AYR.

Tramways to Continue.

At a meeting of the Town Council on August 11 a motion by Treasurer Galloway that a plebiscite be taken on the question of continuing or scrapping the tramways was defeated by the casting vote of Provost Stewart. It was then decided to accept tenders totalling £11,863 for relaying the track from the Grammar School to the Town Hall, and a tender for reconditioning three cars.

## BELFAST.

Fifty New Cars to be Ordered.

The Tramways Committee has decided to order 50 new tramcars. These will be of the most recent type, and will be equipped with special air brakes.

## BEXLEY.

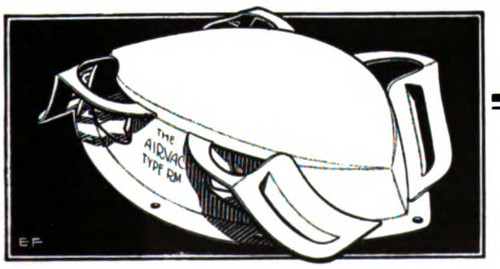
Future of the Tramways.

A conference of the Bexley and Dartford Urban Councils is to be held shortly for the purpose of considering future policy in relation to the tramways owned by the two authorities. Mr. A. J. Abraham, general manager and electrical engineer, reports that when he took charge eight years ago the undertaking was in a shocking condition. For some years he has been keeping the tramways up with the help of second-hand rails, tramway standards and plant and material carefully chosen from scrapped tramways in other towns. Mr. Abraham adds that notwithstanding the difficulties the tramways have become an asset to the ratepayers, and have proved that a new and up-to-date system would be very valuable.

## BOURNEMOUTH.

System of Discipline.

A sub-committee of the Tramways Committee recently reported on the question of disciplinary measures, and recommended that the present system by which cases of infringement of the regulations are dealt with by the heads of departments and the general manager should be improved. In a discussion opinion was expressed by some members that cases should be dealt with by the Tramways Committee, Mr. I. Bulfin, the tramways manager, being called upon, said the present system had been in operation since 1912. Every case was considered by the head of the department and himself, and every member of the staff knew perfectly well what the punishment was before he infringed the regulations. The same system was enforced in every tramways undertaking in the country. It was decided to adhere to the present system, but that the book of punishments should be placed before the committee at their meetings.

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## EDINBURGH.

Experiments to Stop Tail-Wagging and Jazzing.

The model tramcar which Edinburgh Transport Department is to build at a cost of £4,000 will include devices with the object of preventing cars from tail-wagging and jazzing when travelling at high speed. Councillor Adam Millar, convener of the Transport Committee, states that they have not an ideal car in view at present, but the latest models, with their all-enclosed tops, comfortable upholstery, and interior heating, were proving very popular with the public.

## GLASGOW.

Juvenile Fares—Law of Property Found on Tramcars.

The Corporation Transport Committee has decided as an experiment that all children under fifteen shall be allowed to travel two stages on the tramcars for a halfpenny instead of one stage as at present. The concession begins in September and will be reviewed in December. During the hearing of a case, when a tramcar conductor was alleged to have failed to return property which had been found on his car and handed to him by a passenger, the stipendiary magistrate stated that if a passenger refused to hand over such property the conductor would have no right to call the police. He could take the passenger's name and address, with those of witnesses, and make a report, but a passenger was not bound to give property up; he could take it to the police. Mr. D. Stenhouse, the Town Clerk, replies to this statement by quoting Section 79 of the Glasgow Corporation (Tramways Consolidation) Order, 1905, which provides that property found in the cars shall forthwith be delivered to the conductor, who shall take it to the place appointed by the Corporation, and if unclaimed within six months it may be sold. Any finder failing or refusing to give up such property is guilty of an offence.

## HALIFAX.

£20,000 to be Spent on New Cars.

The Corporation proposes to order a number of new tramcars at a cost of £20,000.

## LONDON.

Pupils' 4d. Tickets—Haydons Road Route—Record Travelling for 1s.—The Conductor's Platform.

The fourpenny all-day pupils' tickets, which the L.C.C. decided upon some time ago as an experiment, came into operation on August 26, when the L.C.C. schools reopened. London United Tramways, Ltd., and the L.C.C. propose to enter into an agreement under which the Council will operate the Haydons Road tramway which links the Garratt Lane section at Summerstown with Merton High Street on the company's Tooting-Wimbledon line, which is also worked by the County Council. The construction of a change pit at a cost of £2,450 will enable the Council's cars to run through. A Londoner has established a record for tramway travelling by riding 175 miles on the L.C.C. tramways with a shilling-all-day ride-at-will ticket. He started at 5.22 a.m., and did not finish until 2.5 a.m. the next day, as he missed the last car and had to wait for an all-night tramcar. He travelled on 31 cars, and at the ordinary single fare rates his journeys would have cost 9s. 2d. His ticket was available up to 3 a.m. At an inquest at Islington on a woman who fell from a tramcar which started as she was boarding it at a request stop, it was stated that the conductors are only bound to be on their platforms at compulsory stopping places. Returning a verdict of "Accidental death," the jury added a rider that conductors should be on the platform at all stopping places.

## SHEFFIELD.

Twenty New Cars—Tramways and the New Park.

The Tramways Department are to construct twenty new cars in their own workshops during the current financial year. For the opening on September 4 of the new park at Shiregreen, which has been presented to the city by Alderman J. G. Graves, special tramcars conveyed the Lord Mayor and party to show the accessibility of the park from the city.

## WARWICK.

Tramways Superseded.

Leamington and Warwick Tramways Co. discontinued their tramway services on August 18 and replaced the cars with omnibuses, powers for which were obtained under the terms of the Leamington and Warwick Traction Act, 1929. The tramway tracks are in process of removal. The rails, which weigh 90 lb. to the yard, are to be sold as scrap. The original horse car service was inaugurated in 1882 and was continued until July, 1905, when they were replaced by electric cars.

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## PERSONAL.

**Lord Cromer** has been elected a director of the Metropolitan Railway Company.

**Mr. E. B. Blainey,** of Barry, has been appointed manager of Gellygaer Urban Council omnibus department.

**Mr. F. J. Elliott** has been appointed chief engineering assistant at the Wolverhampton Corporation Electricity works.

**Mr. F. C. Lamacraft,** and inspector on the staff of Exeter Corporation Tramways, has been appointed traffic superintendent.

**Mr. S. A. Maddocks** has been appointed by the New South Wales Government as transport commissioner at a salary of £1,800 per annum.

**Mr. Eric Mitford,** of the Gateshead and District Tramways Company, has been appointed assistant engineer of the Hong Kong Tramways, Ltd.

**Mr. George Cox,** superintendent of the Abbey Wood district of the London County Council Tramways, has retired at the age of 73, after 53 years' service.

**Mr. E. O. Milne** has been appointed chairman of the tramways and omnibus management board of New South Wales Government at a salary of £1,500 per annum.

**Dr. Douglas Ingall,** Principal of Constantine College, Middlesbrough, has been appointed Assistant Director of the British Non-Ferrous Metals Research Association.

**Mr. N. A. Hardie,** general manager (sales) of the Associated Equipment Co., has returned from a tour through South America. Mr. Hardie left England in March last.

**Mr. W. B. Woodhouse,** engineer and manager of Electrical Distribution of Yorkshire, Ltd., since the formation of the company, has been appointed a director of the company.

**Mr. J. C. Fairchild,** recently appointed transport manager and electrical engineer of Lytham St. Annes Corporation, has been granted an increase of salary of £100 per annum.

**Mr. P. M. Rossdale** has been appointed chairman of the Yorkshire (Woollen District) Electric Tramways, Ltd., in succession to Mr. L. M. Myers, who resigned on account of ill-health.

**Mr. L. Mackinnon,** general manager of Glasgow Corporation Transport Department, is to be presented with his portrait in oils by the employees and officers, who number 8,624.

**Mr. J. J. Marshall** has been appointed general manager of Falkirk and District Traction Co. He was formerly with the Scottish General Omnibus Co. and Dunfermline Traction Co.

**Mr. G. H. Lake,** on terminating his service as electrical engineer at Derby in order to fill a similar position at Nottingham, has been presented by the staff with a Crown Derby china tea set.

**Mr. F. Nicholls,** deputy borough electrical engineer of Derby, has been appointed borough electrical engineer, at a salary of £1,100 a year. Mr. Nicholls succeeds Mr. G. H. Lake, who is going to Nottingham.

**Mr. Wallace Jones,** an ex-Birmingham motorman, has obtained another musical appointment besides that of first tuba player in the Hallé Orchestra, Manchester. The second appointment is with Liverpool Philharmonic Orchestra.

**Mr. H. E. Fulton,** a managing director of the Albion Motor Car Co., Ltd., of Glasgow, has returned from a three months' tour of South Africa. He holds hopeful views regarding increased business with that country and overseas countries in general.

**Mr. Fred. R. Purchase,** a native of Bushbury, Wolverhampton, has been appointed to an important position in the new Goodyear Tyre Factory recently built at Buenos Aires. He joined the Goodyear company at Wolverhampton as a factory hand early in 1928.

**Mr. F. G. Bristow,** general secretary of the Commercial Motor Users' Association, during the next few months will give addresses on the Road Traffic Act to Rotary Clubs. Mr. Bristow has been elected chairman of the Road Safety Committee of the National Safety First Association.

**Mr. A. W. Matheson,** chief traffic clerk of the Cardiff Tramways Department, has retired after nearly forty years' service. At a farewell gathering on August 19, Mr. William Forbes, general manager of the tramways, made presentations to Mr. and Mrs. Matheson on behalf of all sections of the department.

**Mr. J. H. Millen,** who was recently appointed electrical engineer to the London Underground Railway Companies, has been with those companies for twenty-seven years. At one time he was with the Dublin Tramways. Returning to London in 1903 he became chief assistant during the erection of the Lots Road power house. In 1916 he was appointed assistant superintendent of power, and superintendent in 1926.

**Mr. E. J. Doran,** tramway traffic manager at Sydney, has been asked by the New South Wales Government to assist in the reorganisation of road transport under the new Transport Trust, which will have control of all the State transport services, except railways.


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This is a recognition of Mr. Doran's outstanding work for the tramways. He will retire at the end of the year, when he reaches the age of 65, on a pension of £800 a year. **Mr. E. O. Milne,** general manager of the Tramway Management Board under the Transport Trust, is likely to succeed Mr. Doran, according to the Acting Premier.

**Mr. C. F. Wolsey,** who, as reported in our issue of August 9, has been appointed traffic superintendent of Stockport Corporation Tramways and Omnibuses, will take up his new duties in September. During the past eleven years Mr. Wolsey has been a chief assistant in the traffic department of Sheffield Tramways and Omnibuses, and he was previously with Lowestoft Corporation Tramways. In 1927 he was awarded the first prize and silver medal of the Municipal Tramways and Transport Association for an essay on transport operating problems. There were 42 applicants for the Stockport appointment.

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**Sir Robert Harvey,** a director of the Lima Light Power and Tramways Co., who died on March 14 last, left estate of the gross value of £276,874, with net personalty of £253,954.

## CONTRACTS AND ORDERS.

**Sheffield Tramways Committee** has placed a contract with J. Brown & Co., Ltd., for 500 steel tyres for car wheels.

**Hull Tramways Committee** has accepted the tender of Richard Johnson & Nephew for supplying two miles of trolley wire.

**Leeds Corporation** has ordered a T.A. type electro-magnetic crack detector from the Equipment & Engineering Co., Ltd.

**Buenos Aires Pacific Railway** have placed an order for a type F. electro-magnetic crack detector with the Equipment & Engineering Co., Ltd.

**The Southern Railway** have placed a contract for twelve months, supply of Siemens' electric lamps, with Siemens Electric Lamps and Supplies, Ltd.

**Manchester Transport Committee** has accepted the tender of Heenan & Froude, Ltd., for the supply of an electro-dynamometer for testing bus engines.

**Glasgow Transport Committee** has placed a contract for a steel cable required for the subway. The length of the cable is more than seven miles and the cost about £3,000.

**The Central Electricity Board** has accepted the tender of W. T. Henley's Telegraph Works, Ltd., for the supply and installation of cables in connection with the South-East England electricity scheme.

**Liverpool Tramways Committee** has placed the following contracts: Welding of 200 tramway rail joints, Murex, Ltd.; tramway special trackwork, Edgar Allen & Co., Ltd.; electrically-driven tower wagon, General Vehicle Co.

**Glasgow Corporation** has placed contracts for reconstruction of rotary converters with Bruce, Peebles & Co., British Thomson-Houston Co., General Electric Co., Metropolitan-Vickers Electrical Co., and the English Electric Co.

**Manchester Transport Committee** has accepted the tender of the Cargo Fleet Iron Co., Ltd., for the supply of girder tramway rails and the tender of A. & E. Sudlow & Co., Manchester, for electric light and power installation at Hyde Road car works.

**Newcastle-upon-Tyne Electric Supply Co.** has placed a contract with Robert McAlpine & Sons, for site works and foundations, for new Dunston-on-Tyne power station, which is to be built in connection with the North-East England scheme. The contract is valued at £200,000.

**Rotherham Tramways Committee** has recommended acceptance of the tenders of Ransomes, Sims & Jefferies, Ltd., for 20 trolleybus chassis, and of Cravens, Ltd., for the bodies; also the tender of the British Mannesmann Tube Co., Ltd., for poles required for the conversion of the Dalton and Kimberworth tramway route to railless traction.

**Glasgow Transport Committee** has accepted the tender of the Edison Swan Electric Co., Ltd., for the supply of a battery for Dalmuir sub-station, and of the Brush Electrical Engineering Co., Ltd., for the supply of three transformer cases for sub-stations. The Committee has also accepted the tenders of J. B. Blakeborough & Sons, Ltd., for sluice valves, and of Messrs. Dewrance & Co. for steam valves for Pinkstone Power Station.

**International Combustion, Ltd.,** of Africa House, Kingsway, London, has an order from the North Metropolitan Power Station Co., Ltd., for plant for the extensions to Brimsdown power station. The new plant will comprise four combustion steam generators of 175,000 to 200,000 lb. per hour evaporation at 325 lb. pressure and 780° F. final temperature, each boiler being unit-fired by Raymond-Lopulco Mills. This is the third order for pulverised fuel plant at Brimsdown station secured by International Combustion, Ltd.

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# TRAFFIC RETURNS.

## Tramway and Omnibus Undertakings in the United Kingdom.

| NAME OF COMPANY OR CORPORATION | 1929. WEEKS ENDING | | | | | 1930. WEEKS ENDING | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Aug. 10 | Aug. 17 | Aug. 24 | Aug. 31 | ... | Aug. 9 | Aug. 16 | Aug. 23 | Aug. 30 | ... | Wks. | 1930 | Increase or Decrease |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Aberdeen Corporation ... ... ... | 6,319 | 5,704 | 5,420 | 5,486 | ... | 6,344 | 6,175 | 5,593 | 5,595 | ... | 13½ | 79,012 | + 940 |
| Ashton-under-Lyne Corporation ... | 1,757 | 1,770 | 1,588 | 1,669 | ... | 1,629 | 1,736 | 1,573 | 1,580 | ... | 22 | 35,623 | — 1,754 |
| Ayr Corporation ... ... ... ... | 925 | 790 | 717 | 680 | ... | 874 | 748 | 654 | 636 | ... | 15 | 10,646 | — 863 |
| Barrow Corporation ... ... ... | 1,423 | 1,228 | 1,145 | 1,072 | ... | 1,310 | 998 | 1,027 | 1,123 | ... | 22 | 22,433 | — 252 |
| Belfast City ... ... ... ... | 11,754 | 12,671 | 12,921 | 12,043 | ... | 12,183 | 12,099 | 12,850 | 13,602 | ... | 21½ | 276,140 | + 13,982 |
| Birkenhead Corporation ... ... ... | 11,902 | 6,417 | 5,362 | 5,239 | ... | 6,163 | 5,922 | 5,660 | 5,728 | ... | 22 | 116,950 | — 5,941 |
| Birmingham Corporation ... ... | 36,917 | 38,701 | 39,483 | 41,012 | ... | 36,227 | 39,904 | 40,976 | 41,845 | ... | 22 | 927,881 | + 38,610 |
| Blackburn Corporation ... ... ... | 2,526 | 1,963 | 1,901 | 1,915 | ... | 1,798 | 2,045 | 2,079 | 2,107 | ... | 21½ | 46,058 | + 3,469 |
| Bradford Corporation ... ... ... | 14,856 | 13,448 | 14,464 | 14,895 | ... | 13,914 | 12,881 | 14,022 | 14,234 | ... | 22 | 311,724 | — 13,545 |
| Brighton Corporation ... ... ... | 5,235 | 3,472 | 3,424 | 3,413 | ... | 5,101 | 3,477 | 3,391 | 3,683 | ... | 21½ | 64,499 | + 2,241 |
| Burnley Corporation ... ... ... | 3,720 | 3,559 | 3,433 | 3,691 | ... | 3,652 | 3,463 | 3,340 | 3,365 | ... | ... | ... | ... |
| Burton-on-Trent Corporation ... ... | 881 | 795 | 802 | 804 | ... | 891 | 798 | 831 | 826 | ... | 22 | 18,586 | + 620 |
| Bury Corporation ... ... ... | 2,471 | 2,167 | 2,547 | 2,552 | ... | 2,894 | 2,725 | 2,907 | 3,054 | ... | 21½ | 64,211 | + 9,853 |
| Chatham and District ... ... ... | 1,490 | 1,538 | 1,404 | 1,483 | ... | 1,518 | 1,327 | 1,288 | 1,388 | ... | 34 | 39,626 | + 641 |
| Chester Corporation ... ... ... | 488 | 439 | 459 | 435 | ... | 736 | 681 | 693 | 689 | ... | 22 | 14,692 | + 4,823 |
| Chesterfield Corporation ... ... ... | 2,170 | 2,034 | 1,903 | 1,946 | ... | 2,199 | 2,054 | 1,947 | 1,877 | ... | 22 | 41,916 | + 1,099 |
| Colchester Corporation ... ... ... | 617 | 588 | 585 | 589 | ... | 684 | 642 | 652 | 644 | ... | 23 | 14,171 | + 1,561 |
| Colne Corporation ... ... ... | 796 | 726 | 716 | 758 | ... | 763 | 691 | 693 | 698 | ... | 23 | 15,880 | — 210 |
| Coventry Corporation ... ... ... | 3,616 | 3,495 | 3,614 | 3,624 | ... | 3,598 | 3,500 | 3,628 | 3,693 | ... | 22 | 83,753 | + 2,418 |
| Darlington Corporation ... ... ... | 973 | 957 | 978 | 1,000 | ... | 1,057 | 1,022 | 1,030 | 1,049 | ... | 21½ | 23,185 | + 2,023 |
| Derby Corporation ... ... ... | 3,531 | 3,399 | 3,186 | 3,392 | ... | 3,606 | 3,352 | 3,236 | 3,329 | ... | 22 | 73,802 | + 3,126 |
| Dover Corporation ... ... ... | 624 | 579 | 585 | 556 | ... | 611 | 573 | 616 | 626 | ... | 22 | 9,847 | + 342 |
| Dundee City ... ... ... ... | 3,475 | 3,471 | 3,611 | ... | ... | 3,697 | 3,871 | 3,946 | ... | ... | 14½ | 54,118 | + 2,863 |
| East Ham Corporation ... ... ... | 2,296 | 2,305 | 2,383 | 2,324 | ... | 2,170 | 2,305 | 2,357 | 2,325 | ... | 21½ | 50,072 | + 733 |
| Edinburgh Corporation ... ... ... | 16,838 | 17,178 | 16,633 | 17,164 | ... | 18,717 | 17,704 | 17,513 | 18,090 | ... | 15½ | 394,885 | + 10,902 |
| Exeter Corporation ... ... ... | 1,124 | 1,095 | 1,116 | 1,150 | ... | 1,206 | 1,194 | 1,220 | 1,250 | ... | 23 | 25,819 | + 2,653 |
| Glasgow Corporation ... ... ... | 47,018 | 47,891 | 48,894 | 49,041 | ... | 49,239 | 45,079 | 52,420 | 52,901 | ... | 13 | 657,934 | + 42,165 |
| Gloucester Corporation ... ... ... | 671 | 596 | 560 | 596 | ... | 833 | 706 | 705 | 737 | ... | 21½ | 15,243 | + 3,291 |
| Grimsby Corporation ... ... ... | 2,008 | 1,739 | 1,656 | 1,594 | ... | 1,968 | 1,854 | 1,758 | 1,852 | ... | 22 | 35,220 | + 3,858 |
| Halifax Corporation ... ... ... | 4,574 | 5,039 | 4,732 | 4,647 | ... | 5,039 | 4,855 | 5,201 | 5,329 | ... | 22½ | 115,334 | + 13,349 |
| Huddersfield Corporation ... .. | 6,359 | 6,039 | 6,278 | 6,680 | ... | 6,313 | 6,036 | 6,381 | 6,559 | ... | 22 | 139,999 | — 1,529 |
| Hull Corporation ... ... ... ... | 7,200 | 7,214 | 7,114 | 7,284 | ... | 7,035 | 7,391 | 7,225 | 7,252 | ... | 22 | 158,503 | + 2,277 |
| Ilford Corporation ... ... ... | 1,483 | 1,404 | 1,426 | 1,462 | ... | 1,410 | 1,429 | 1,480 | 1,456 | ... | 21½ | 32,944 | + 616 |
| Ipswich Corporation Trolley Buses ... | 1,533 | 1,367 | 1,351 | 1,399 | ... | 1,538 | 1,417 | 1,417 | 1,442 | ... | 21½ | 29,703 | + 1,660 |
| Isle of Thanet ... ... ... ... | 2,805 | 2,903 | 2,654 | 2,524 | ... | 2,460 | 2,398 | 2,164 | 2,066 | ... | 34½ | 29,465 | — 3,228 |
| Kilmarnock Corporation ... ... | 387 | 450 | 478 | 482 | ... | 381 | 440 | 498 | 506 | ... | 15½ | 7,506 | + 303 |
| Leeds Corporation ... ... ... | 17,701 | 19,530 | 19,122 | 19,925 | ... | 17,239 | 19,106 | 19,431 | 20,115 | ... | 21½ | 435,601 | + 9,357 |
| Leicester Corporation ... ... ... | 7,280 | 7,914 | 8,185 | 8,361 | ... | 7,154 | 7,703 | 8,039 | 8,322 | ... | 22 | 181,962 | + 814 |
| Lincoln Corporation Buses ... ... | 1,094 | 950 | 969 | ... | ... | 979 | 1,003 | 961 | ... | ... | 21 | 19,724 | + 70 |
| Liverpool Corporation ... ... ... | 32,377 | 30,560 | 29,300 | 30,078 | ... | 30,399 | 29,176 | 29,608 | 30,640 | ... | 21½ | 656,651 | + 839 |
| London County Council ... ... ... | 80,627 | 78,888 | 79,569 | 80,619 | ... | 77,350 | 77,106 | 80,448 | 80,600 | ... | 21½ | 1,758,685 | — 11,636 |
| Luton Corporation ... ... ... | 396 | 406 | 408 | 436 | ... | 396 | 383 | 401 | 424 | ... | 21½ | 9,157 | + 306 |
| Maidstone Corporation ... ... ... | 891 | 821 | 798 | 785 | ... | 947 | 864 | 857 | 872 | ... | 21½ | 19,281 | + 1,240 |
| Manchester Corporation ... ... ... | 38,779 | 38,581 | 38,538 | 39,700 | ... | 38,851 | 38,558 | 39,840 | 40,076 | ... | 22 | 889,053 | + 21,383 |
| Middlesbrough Corporation ... ... | 1,641 | 1,742 | 1,817 | 1,788 | ... | 1,506 | 1,608 | 1,616 | 1,559 | ... | 22½ | 35,910 | — 924 |
| Newcastle-on-Tyne Corporation ... | 12,691 | 12,265 | 12,270 | ... | ... | 12,202 | 11,541 | 11,701 | ... | ... | 20½ | 246,150 | — 6,065 |
| Newport Corporation ... ... ... | 3,005 | 2,338 | 2,340 | 2,456 | ... | 2,864 | 2,238 | 2,351 | 2,393 | ... | 22 | 52,892 | — 354 |
| Northampton Corporation ... ... | 1,810 | 1,758 | 1,778 | 1,815 | ... | 1,837 | 1,803 | 1,747 | 1,833 | ... | 21½ | 39,404 | + 1,005 |
| Nottingham Corporation ... ... | 9,618 | 9,349 | 9,439 | 9,404 | ... | 10,524 | 9,663 | 9,829 | 9,980 | ... | 21½ | 220,997 | + 17,397 |
| Oldham Corporation ... ... ... | 5,428 | 5,337 | 5,456 | 5,831 | ... | 5,376 | 5,253 | 5,332 | 5,717 | ... | 23 | 123,138 | — 6,124 |
| Plymouth Corporation ... ... ... | 6,275 | 6,257 | 7,394 | 6,094 | ... | 7,649 | 6,439 | 6,216 | 6,710 | ... | 21 | 135,161 | + 8,185 |
| Portsmouth Corporation ... .. | 10,382 | 9,413 | 9,726 | 8,803 | ... | 12,330 | 9,825 | 9,786 | 10,262 | ... | 22 | 174,819 | + 21,997 |
| Preston Corporation ... ... ... | 2,310 | 2,164 | 2,159 | 2,293 | ... | 2,288 | 2,119 | 2,064 | 2,170 | ... | 21½ | 46,670 | — 1,141 |
| Rawtenstall Corporation ... ... | 1,386 | 1,317 | 1,380 | 1,331 | ... | 1,391 | 1,369 | 1,400 | 1,361 | ... | 21½ | 29,632 | — 386 |
| Reading Corporation ... ... ... | 2,757 | 2,443 | 2,393 | 2,536 | ... | 2,702 | 2,326 | 2,398 | 2,550 | ... | 22 | 52,977 | + 605 |
| Rochdale Corporation ... ... ... | 4,476 | 4,329 | 3,520 | 4,334 | ... | 4,382 | 4,281 | 4,321 | 4,269 | ... | ... | 94,355 | — 4,338 |
| Rotherham Corporation ... ... ... | 2,947 | 2,593 | 2,671 | 2,668 | ... | 2,916 | 2,597 | 2,754 | 2,615 | ... | 22 | 60,467 | + 1,975 |
| Salford Corporation ... ... ... | 10,875 | 10,734 | 11,061 | 11,060 | ... | 10,072 | 10,592 | 10,718 | 10,785 | ... | 21½ | 244,375 | + 1,119 |
| Sheffield Corporation ... ... ... | 21,689 | 20,641 | 20,262 | 20,830 | ... | 19,539 | 19,099 | 19,451 | 20,075 | ... | 21½ | 447,870 | — 11,955 |
| Southampton Corporation ... ... | 4,942 | 4,584 | 4,429 | 4,490 | ... | 5,048 | 4,585 | 4,635 | 4,653 | ... | 22 | 94,405 | + 4,178 |
| Southend-on-Sea Corporation ... ... | 3,903 | 3,724 | 3,771 | 3,716 | ... | 3,650 | 3,639 | 3,495 | 3,702 | ... | 22½ | 60,975 | — 183 |
| Southport Corporation ... ... ... | 2,532 | 2,341 | 2,124 | 2,332 | ... | 2,515 | 2,135 | 1,995 | 2,371 | ... | 21½ | 40,796 | + 405 |
| St. Helens Corporation ... ... ... | 2,195 | 2,074 | 1,968 | 1,988 | ... | 2,276 | 2,093 | 2,039 | 2,034 | ... | 21½ | 43,349 | + 2,498 |
| Sunderland Corporation ... ... ... | 3,167 | 3,107 | 2,961 | 2,838 | ... | 3,474 | 3,322 | 3,395 | 3,241 | ... | 22 | 69,488 | + 9,561 |
| Swindon Corporation ... ... ... | 1,052 | 994 | 893 | 940 | ... | 1,131 | 1,087 | 1,063 | 1,076 | ... | 21½ | 21,245 | + 4,522 |
| Wallasey Corporation ... ... ... | 5,393 | 4,433 | 3,754 | 3,633 | ... | 4,932 | 4,054 | 3,993 | 4,219 | ... | 21½ | 82,177 | + 2,628 |
| Walsall Corporation ... ... ... | 4,022 | 3,315 | 3,405 | 3,585 | ... | 3,691 | 3,342 | 3,400 | 3,534 | ... | 22 | 76,092 | + 1,170 |
| Walthamstow Corporation ... ... | 2,511 | 2,457 | 2,462 | 2,624 | ... | 2,362 | 2,407 | 2,496 | 2,533 | ... | 21½ | 54,220 | — 115 |
| Warrington Corporation ... ... ... | 1,309 | 1,279 | 1,286 | 1,315 | ... | 1,339 | 1,335 | 1,334 | 1,350 | ... | 22 | 34,271 | + 1,309 |
| West Ham Corporation ... ... ... | 6,060 | 5,954 | 6,052 | 6,169 | ... | 5,773 | 5,635 | 5,918 | 5,884 | ... | 21½ | 130,054 | + 1,514 |
| Wolverhampton Corporation ... ... | 7,197 | 5,894 | 6,328 | 6,132 | ... | 6,712 | 5,625 | 5,872 | 5,824 | ... | 22 | 131,141 | — 4,337 |
| York Corporation ... ... ... | 1,547 | 1,582 | 2,029 | 1,759 | ... | 1,602 | 1,594 | 2,078 | 1,773 | ... | 23 | 35,795 | + 1,609 |

## Underground Electric Railways Company of London, Limited.

| NAME OF COMPANY | 1929. WEEKS ENDING | | | | | 1930. WEEKS ENDING | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Aug. 10 | Aug. 17 | Aug. 24 | Aug. 31 | ... | Aug. 9 | Aug. 16 | Aug. 23 | Aug. 30 | ... | Wks. | 1930 | Increase or Decrease |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Underground Rlys. (Common Fund Co.) | 295,000 | 280,200 | 278,400 | 290,600 | ... | 293,700 | 288,100 | 290,900 | 295,600 | ... | 35 | 10,526,700 | + 614,100 |
| London and Suburban District ... ... | 45,600 | 43,600 | 42,600 | 44,900 | ... | 44,200 | 43,900 | 44,300 | 45,500 | ... | 35 | 1,545,000 | + 100,300 |

## Colonial and Foreign Tramway Traffic Returns.

| NAME OF COMPANY OR CORPORATION | 1929. WEEKS ENDING | | | | | 1930. WEEKS ENDING | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Aug. 10 | Aug. 17 | Aug. 24 | Aug. 31 | ... | Aug. 9 | Aug. 16 | Aug. 23 | Aug. 30 | ... | Wks. | 1930 | Increase or Decrease |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Anglo-Argentine ... ... ... ... | 84,606 | 81,598 | 84,453 | 82,455 | ... | 80,394 | 75,140 | 76,654 | 71,854 | ... | 35 | 2,881,383 | — 134,503 |
| Buenos Aires Lacroze ... ... ... | 11,338 | 11,516 | 11,750 | 11,645 | ... | 10,880 | 10,913 | 10,651 | 10,913 | ... | 9 | 94,744 | — 8,322 |
| Calcutta ... ... ... *Rupees* | 126,048 | 132,919 | 124,717 | 121,393 | ... | 108,338 | 107,712 | 107,938 | 103,356 | ... | 34½ | 3,865,927 | — 543,336 |
| Madras (2 weeks) ... *Rupees* | ... | 46,482 | ... | 45,618 | ... | ... | 48,656 | ... | 47,245 | ... | 34 | 741,958 | + 37,253 |

| | 1929. | | | | | | 1930. | | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mar. | April | May | June | July | Aug. | Mar. | April | May | June | July | Aug. | Mths. | 1930 | Increase or Decrease |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Brazilian Trac. $ | 3,928,550 | 4,042,145 | 4,206,895 | 4,210,893 | 4,335,895 | 4,333,460 | 4,047,036 | 4,127,492 | 4,304,160 | 4,146,884 | 4,081,018 | ... | 7 | 28,367,377 | — 5,543 |
| British Columbia $ | 1,243,592 | 1,205,482 | 1,165,279 | 1,133,017 | 1,156,720 | ... | 1,258,375 | 1,213,993 | 1,203,292 | 1,144,585 | 1,196,239 | ... | 1 | 1,196,239 | + 39,519 |
| Burma ... Rs. | 68,993 | 64,744 | 66,077 | 63,157 | 64,649 | 61,309 | 72,758 | 65,482 | 66,320 | 66,317 | 66,444 | ... | 12 | 776,289 | — 17,071 |
| Cape Town ... | 30,121 | 29,244 | 29,366 | 27,995 | 27,779 | 27,639 | 30,087 | 27,500 | 27,286 | 25,525 | 24,953 | ... | ... | ... | ... |
| Carthagena & H.... | 853 | 1,063 | 725 | 1,476 | 1,100 | 1,169 | 1,003 | 905 | 552 | 515 | 738 | 505 | 8 | 6,855 | — 1,235 |
| Durban ... ... | 24,442 | 25,603 | 24,518 | 24,308 | 29,110 | ... | 23,662 | 24,002 | 23,945 | 23,440 | 27,019 | ... | 12 | 288,972 | — 3,643 |
| East India ... | 3,892 | 3,798 | 3,862 | 3,772 | 3,801 | 4,152 | 3,863 | 3,601 | 3,698 | 3,803 | 3,833 | 3,948 | 1 | 3,948 | — 204 |
| Kalgoorlie... ... | 1,682 | 1,673 | 1,747 | 1,660 | ... | ... | 1,710 | 1,718 | 1,815 | ... | ... | ... | 5 | 8,134 | — 68 |
| Para ... ... | 14,971 | 15,060 | 15,182 | 15,450 | 15,044 | 15,221 | 14,976 | 15,564 | 15,568 | 15,028 | 14,816 | ... | 8 | 118,623 | + 521 |
| Port Elizabeth ... | 7,857 | 7,877 | 7,601 | 7,335 | 7,503 | 7,402 | 8,127 | 7,521 | 7,552 | 6,951 | 7,045 | ... | ... | ... | ... |
| Rangoon ... Rs. | 121,246 | 120,855 | 121,040 | 114,535 | 122,630 | 123,550 | 164,600 | 148,215 | 149,440 | 142,170 | 151,300 | 146,320 | 8 | 1,197,255 | + 242,264 |
| Shanghai ... $ | 339,785 | 336,624 | 339,833 | 335,740 | 329,139 | 335,172 | 377,849 | 308,840 | 183,409 | 367,231 | 145,000 | ... | 7 | 1,368,000 | + 154,000 |
| Singapore ... $ | 133,000 | 131,000 | 133,000 | 123,000 | 131,000 | 130,000 | 143,000 | 137,000 | 148,000 | 140,000 | ... | ... | 9 | 1,223,000 | + 140,000 |
| Winnipeg ... $ | 572,492 | 536,033 | 534,954 | 517,738 | 497,935 | ... | 571,157 | 516,132 | 509,709 | 479,958 | 452,212 | ... | 7 | 3,725,716 | — 112,297 |

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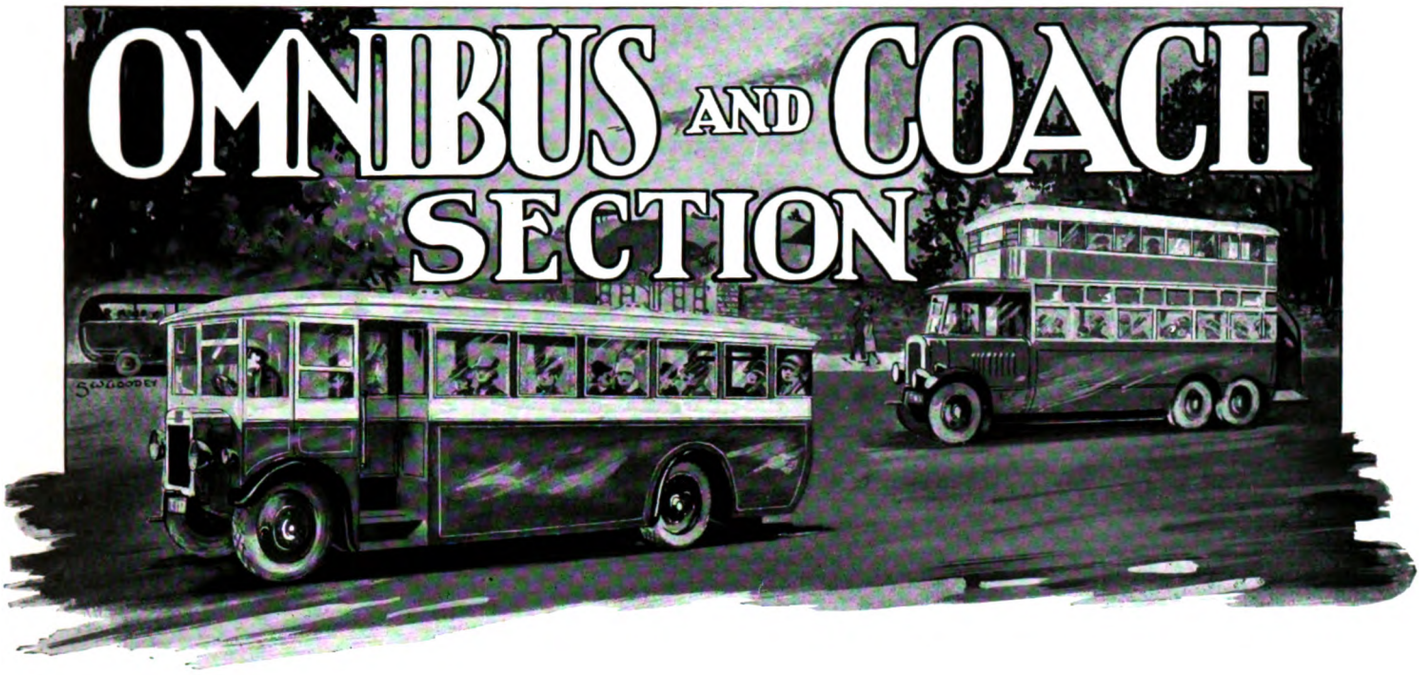


**OMNIBUS AND COACH SECTION—TWENTY-FIFTH YEAR OF PUBLICATION.**

### PROVISIONS TO SECURE SAFETY.

During some week-ends this summer there have been more fatalities to passengers in all classes of road vehicles than have occurred in a year on the railways. Unfortunately public vehicles sometimes figure in these mishaps, the most frequent causes of which are collision, overturning from several causes, including skidding, and fire. Notwithstanding all that is done to inculcate drivers with a zeal for carefulness by means of the booklet issued with driving licences and by warnings from employers, the number of collisions tends to increase. As to skidding, it would seem to be possible, bearing in mind what has been accomplished in some places, to provide road surfaces that will lessen the risk. The tendency to skid is increased by the dropping of oil and grease from sumps, differentials and various lubricating points. Some of the mess might be prevented by a reversion to the trays that had to be fitted to early omnibus chassis in London. Fire is the most serious problem. One cause of an outbreak is a blow-back from the engine, usually caused by a stuck inlet valve. Often the outbreak can be subdued quickly by turning off the supply of petrol to the carburettor. The tap for this ought to be mounted on the dashboard. More fires occur on private cars than on public passenger vehicles, because the petrol tank in many of the former is under the bonnet or the dashboard. Concurrently with the collision causing a leak, a spark fires the vapour. On large private cars the tank is placed at the rear, and is further protected by the spare wheel. Opinion differs as to whether public vehicles should have the tank at the rear or on the off-side, as is now largely the case. Whichever position is adopted the tank might be guarded by a shield. An auxiliary tank near the engine should give place to a mechanical pump. One emergency door should certainly be at the rear, and the safety of the driver on forward-drive vehicles seems to need more attention. The use of non-splinterable glass ought to be compulsory.

### THE LIMITED EXPRESS COACH.

The acquisition by the London General Omnibus Company of a site near Oxford Street as a station for their Green Line coaches, draws attention to a form of road passenger service which until recently was little known, although very popular with those who had formed its acquaintance. It may be termed a super-omnibus service, placed between the private motor car and the ordinary public omnibus, as it has some of the privileges of the first and fewer of the inconveniences of the second. It is sometimes termed the limited express, a very apposite description, because its stops are less frequent than those of the ordinary omnibus, and it travels faster between points. Its seating accommodation is as roomy and comfortable as that of the private car ; and the fares generally are lower than those of the railway to the same place, but higher than the omnibus fares. In London its line of development is in providing comfortable accommodation for travellers to the country districts and small towns, places averaging a run of about thirty miles, north, south, east and west of London. Its popularity is assured. Business people are attracted by low season ticket rates, shoppers form another large source of fares, and there are always many pleasure seekers who enjoy a run into the country without any fuss or trouble. The time taken is not so much longer than by railway, when taking into consideration that these coaches pick up and set down passengers at more central parts of London than the railways can reach, while in the districts served they will stop for passengers getting on or off at the point nearest home. Many companies are operating such services between London and the outlying districts, and the fact that the Green Line is to have a station adjacent to the busy shopping centre and in the heart of business London, shows that development may be anticipated. The Green Line coaches are becoming more and more familiar on the streets of London, and their popularity will undoubtedly continue to grow.

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# TRAFFIC RETURNS.

## Tramway and Omnibus Undertakings in the United Kingdom.

| NAME OF COMPANY OR CORPORATION | 1929. WEEKS ENDING Aug. 10 | Aug. 17 | Aug. 24 | Aug. 31 | ... | 1930. WEEKS ENDING Aug. 9 | Aug. 16 | Aug. 23 | Aug. 30 | ... | AGGREGATE. Wks. | 1930 | Increase or Decrease |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Aberdeen Corporation ... ... ... | 6,319 | 5,704 | 5,420 | 5,486 | ... | 6,344 | 6,175 | 5,593 | 5,595 | ... | 13½ | 79,012 | + 940 |
| Ashton-under-Lyne Corporation ... | 1,757 | 1,770 | 1,588 | 1,669 | ... | 1,629 | 1,736 | 1,573 | 1,580 | ... | 22 | 35,623 | — 1,754 |
| Ayr Corporation ... ... ... ... | 925 | 790 | 717 | 680 | ... | 874 | 748 | 654 | 636 | ... | 15 | 10,646 | — 863 |
| Barrow Corporation ... ... ... | 1,423 | 1,228 | 1,145 | 1,072 | ... | 1,310 | 998 | 1,027 | 1,123 | ... | 22 | 22,433 | — 252 |
| Belfast City ... ... ... ... | 11,754 | 12,671 | 12,921 | 12,043 | ... | 12,183 | 12,099 | 12,850 | 13,602 | ... | 21½ | 276,140 | + 13,982 |
| Birkenhead Corporation ... ... ... | 11,902 | 6,417 | 5,362 | 5,239 | ... | 6,163 | 5,922 | 5,660 | 5,728 | ... | 22 | 116,950 | — 5,941 |
| Birmingham Corporation ... ... | 36,917 | 38,701 | 39,483 | 41,012 | ... | 36,227 | 39,904 | 40,976 | 41,845 | ... | 22 | 927,881 | + 38,610 |
| Blackburn Corporation ... ... ... | 2,526 | 1,963 | 1,901 | 1,915 | ... | 1,798 | 2,045 | 2,079 | 2,107 | ... | 21½ | 46,058 | + 3,469 |
| Bradford Corporation ... ... ... | 14,856 | 13,448 | 14,464 | 14,895 | ... | 13,914 | 12,881 | 14,022 | 14,234 | ... | 22 | 311,724 | — 13,545 |
| Brighton Corporation ... ... ... | 5,235 | 3,472 | 3,424 | 3,413 | ... | 5,101 | 3,477 | 3,391 | 3,683 | ... | 21½ | 64,499 | + 2,241 |
| Burnley Corporation ... ... ... | 3,720 | 3,559 | 3,433 | 3,691 | ... | 3,652 | 3,463 | 3,340 | 3,365 | ... | ... | ... | ... |
| Burton-on-Trent Corporation ... ... | 881 | 795 | 802 | 804 | ... | 891 | 798 | 831 | 826 | ... | 22 | 18,586 | + 620 |
| Bury Corporation ... ... ... | 2,471 | 2,167 | 2,547 | 2,552 | ... | 2,894 | 2,725 | 2,907 | 3,054 | ... | 21½ | 64,211 | + 9,853 |
| Chatham and District ... ... ... | 1,490 | 1,538 | 1,404 | 1,483 | ... | 1,518 | 1,327 | 1,288 | 1,388 | ... | 34 | 39,626 | + 641 |
| Chester Corporation ... ... ... | 488 | 439 | 459 | 435 | ... | 736 | 681 | 693 | 689 | ... | 22 | 14,692 | + 4,823 |
| Chesterfield Corporation ... ... ... | 2,170 | 2,034 | 1,903 | 1,946 | ... | 2,199 | 2,054 | 1,947 | 1,877 | ... | 22 | 41,916 | + 1,099 |
| Colchester Corporation ... ... ... | 617 | 588 | 585 | 589 | ... | 684 | 642 | 652 | 644 | ... | 23 | 14,171 | + 1,561 |
| Colne Corporation ... ... ... | 796 | 726 | 716 | 758 | ... | 763 | 691 | 693 | 698 | ... | 23 | 15,880 | — 210 |
| Coventry Corporation ... ... ... | 3,616 | 3,495 | 3,614 | 3,624 | ... | 3,598 | 3,500 | 3,628 | 3,693 | ... | 22 | 83,753 | + 2,418 |
| Darlington Corporation ... ... ... | 973 | 957 | 978 | 1,000 | ... | 1,057 | 1,022 | 1,030 | 1,049 | ... | 21½ | 23,185 | + 2,023 |
| Derby Corporation ... ... ... | 3,531 | 3,399 | 3,186 | 3,392 | ... | 3,606 | 3,352 | 3,236 | 3,329 | ... | 22 | 73,802 | + 3,126 |
| Dover Corporation ... ... ... | 624 | 579 | 585 | 556 | ... | 611 | 573 | 616 | 626 | ... | 22 | 9,847 | + 342 |
| Dundee City ... ... ... ... | 3,475 | 3,471 | 3,611 | ... | ... | 3,697 | 3,871 | 3,946 | ... | ... | 14½ | 54,118 | + 2,863 |
| East Ham Corporation ... ... ... | 2,296 | 2,305 | 2,383 | 2,324 | ... | 2,170 | 2,305 | 2,357 | 2,325 | ... | 21½ | 50,072 | + 733 |
| Edinburgh Corporation ... ... ... | 16,838 | 17,178 | 16,633 | 17,164 | ... | 18,717 | 17,704 | 17,513 | 18,090 | ... | 15½ | 394,885 | + 10,902 |
| Exeter Corporation ... ... ... | 1,124 | 1,095 | 1,116 | 1,150 | ... | 1,206 | 1,194 | 1,220 | 1,250 | ... | 23 | 25,819 | + 2,653 |
| Glasgow Corporation ... ... ... | 47,018 | 47,891 | 48,894 | 49,041 | ... | 49,239 | 45,079 | 52,420 | 52,901 | ... | 13 | 657,934 | + 42,165 |
| Gloucester Corporation ... ... ... | 671 | 596 | 560 | 596 | ... | 833 | 706 | 705 | 737 | ... | 21½ | 15,243 | + 3,291 |
| Grimsby Corporation ... ... ... | 2,008 | 1,739 | 1,656 | 1,594 | ... | 1,968 | 1,854 | 1,758 | 1,852 | ... | 22 | 35,220 | + 3,858 |
| Halifax Corporation ... ... ... | 4,574 | 5,039 | 4,732 | 4,647 | ... | 5,039 | 4,855 | 5,201 | 5,329 | ... | 22½ | 115,334 | + 13,349 |
| Huddersfield Corporation ... ... | 6,359 | 6,039 | 6,278 | 6,680 | ... | 6,313 | 6,036 | 6,381 | 6,559 | ... | 22 | 139,999 | — 1,529 |
| Hull Corporation ... ... ... ... | 7,200 | 7,214 | 7,114 | 7,284 | ... | 7,035 | 7,391 | 7,225 | 7,252 | ... | 22 | 158,503 | + 2,277 |
| Ilford Corporation ... ... ... | 1,483 | 1,404 | 1,426 | 1,462 | ... | 1,410 | 1,429 | 1,480 | 1,456 | ... | 21½ | 32,944 | + 616 |
| Ipswich Corporation Trolley Buses ... | 1,533 | 1,367 | 1,351 | 1,399 | ... | 1,538 | 1,417 | 1,417 | 1,442 | ... | 21½ | 29,703 | + 1,660 |
| Isle of Thanet ... ... ... ... | 2,805 | 2,903 | 2,654 | 2,524 | ... | 2,460 | 2,398 | 2,164 | 2,066 | ... | 34½ | 29,465 | — 3,228 |
| Kilmarnock Corporation ... ... | 387 | 450 | 478 | 482 | ... | 381 | 440 | 498 | 506 | ... | 15½ | 7,506 | + 303 |
| Leeds Corporation ... ... ... | 17,701 | 19,530 | 19,122 | 19,925 | ... | 17,239 | 19,106 | 19,431 | 20,115 | ... | 21½ | 435,601 | + 9,357 |
| Leicester Corporation ... ... ... | 7,280 | 7,914 | 8,185 | 8,361 | ... | 7,154 | 7,703 | 8,039 | 8,322 | ... | 22 | 181,962 | + 814 |
| Lincoln Corporation Buses ... ... | 1,094 | 950 | 969 | ... | ... | 979 | 1,003 | 961 | ... | ... | 21 | 19,724 | + 70 |
| Liverpool Corporation ... ... ... | 32,377 | 30,560 | 29,300 | 30,078 | ... | 30,399 | 29,176 | 29,608 | 30,640 | ... | 21½ | 656,651 | + 839 |
| London County Council ... ... ... | 80,627 | 78,888 | 79,569 | 80,619 | ... | 77,350 | 77,106 | 80,448 | 80,600 | ... | 21½ | 1,758,685 | — 11,636 |
| Luton Corporation ... ... ... | 396 | 406 | 408 | 436 | ... | 396 | 383 | 401 | 424 | ... | 21½ | 9,157 | + 306 |
| Maidstone Corporation ... ... ... | 891 | 821 | 798 | 785 | ... | 947 | 864 | 857 | 872 | ... | 21½ | 19,281 | + 1,240 |
| Manchester Corporation ... ... ... | 38,779 | 38,581 | 38,538 | 39,700 | ... | 38,851 | 38,558 | 39,840 | 40,076 | ... | 22 | 889,053 | + 21,383 |
| Middlesbrough Corporation ... ... | 1,641 | 1,742 | 1,817 | 1,788 | ... | 1,506 | 1,608 | 1,616 | 1,559 | ... | 22½ | 35,910 | — 924 |
| Newcastle-on-Tyne Corporation ... | 12,691 | 12,265 | 12,270 | ... | ... | 12,202 | 11,541 | 11,701 | ... | ... | 20½ | 246,150 | — 6,065 |
| Newport Corporation ... ... ... | 3,005 | 2,338 | 2,340 | 2,456 | ... | 2,864 | 2,238 | 2,351 | 2,393 | ... | 22 | 52,892 | — 354 |
| Northampton Corporation ... ... | 1,810 | 1,758 | 1,778 | 1,815 | ... | 1,837 | 1,803 | 1,747 | 1,833 | ... | 21½ | 39,404 | + 1,005 |
| Nottingham Corporation ... ... | 9,618 | 9,349 | 9,439 | 9,404 | ... | 10,524 | 9,663 | 9,829 | 9,980 | ... | 21½ | 220,997 | + 17,397 |
| Oldham Corporation ... ... ... | 5,428 | 5,337 | 5,456 | 5,831 | ... | 5,376 | 5,253 | 5,332 | 5,717 | ... | 23 | 123,138 | — 6,124 |
| Plymouth Corporation ... ... ... | 6,275 | 6,257 | 7,394 | 6,094 | ... | 7,649 | 6,439 | 6,216 | 6,710 | ... | 21 | 135,161 | + 8,185 |
| Portsmouth Corporation ... ... | 10,382 | 9,413 | 9,726 | 8,803 | ... | 12,330 | 9,825 | 9,786 | 10,262 | ... | 22 | 174,819 | + 21,997 |
| Preston Corporation ... ... ... | 2,310 | 2,164 | 2,159 | 2,293 | ... | 2,288 | 2,119 | 2,064 | 2,170 | ... | 21½ | 46,670 | — 1,141 |
| Rawtenstall Corporation ... ... | 1,386 | 1,317 | 1,380 | 1,331 | ... | 1,391 | 1,369 | 1,400 | 1,361 | ... | 21½ | 29,632 | — 386 |
| Reading Corporation ... ... ... | 2,757 | 2,443 | 2,393 | 2,536 | ... | 2,702 | 2,326 | 2,398 | 2,550 | ... | 22 | 52,977 | + 605 |
| Rochdale Corporation ... ... ... | 4,476 | 4,329 | 3,520 | 4,334 | ... | 4,382 | 4,281 | 4,321 | 4,269 | ... | ... | 94,355 | — 4,338 |
| Rotherham Corporation ... ... ... | 2,947 | 2,593 | 2,671 | 2,668 | ... | 2,916 | 2,597 | 2,754 | 2,615 | ... | 22 | 60,467 | + 1,975 |
| Salford Corporation ... ... ... | 10,875 | 10,734 | 11,061 | 11,060 | ... | 10,072 | 10,592 | 10,718 | 10,785 | ... | 21½ | 244,375 | + 1,119 |
| Sheffield Corporation ... ... ... | 21,689 | 20,641 | 20,262 | 20,830 | ... | 19,539 | 19,099 | 19,451 | 20,075 | ... | 21½ | 447,870 | — 11,955 |
| Southampton Corporation ... ... | 4,942 | 4,584 | 4,429 | 4,490 | ... | 5,048 | 4,585 | 4,635 | 4,653 | ... | 22 | 94,405 | + 4,178 |
| Southend-on-Sea Corporation ... ... | 3,903 | 3,724 | 3,771 | 3,716 | ... | 3,650 | 3,639 | 3,495 | 3,702 | ... | 22½ | 60,975 | — 183 |
| Southport Corporation ... ... ... | 2,532 | 2,341 | 2,124 | 2,332 | ... | 2,515 | 2,135 | 1,995 | 2,371 | ... | 21½ | 40,796 | + 405 |
| St. Helens Corporation ... ... ... | 2,195 | 2,074 | 1,968 | 1,988 | ... | 2,276 | 2,093 | 2,039 | 2,034 | ... | 21½ | 43,349 | + 2,498 |
| Sunderland Corporation ... ... ... | 3,167 | 3,107 | 2,961 | 2,838 | ... | 3,474 | 3,322 | 3,395 | 3,241 | ... | 22 | 69,488 | + 9,561 |
| Swindon Corporation ... ... ... | 1,052 | 994 | 893 | 940 | ... | 1,131 | 1,087 | 1,063 | 1,076 | ... | 21½ | 21,245 | + 4,522 |
| Wallasey Corporation ... ... ... | 5,393 | 4,433 | 3,754 | 3,633 | ... | 4,932 | 4,054 | 3,993 | 4,219 | ... | 21½ | 82,177 | + 2,628 |
| Walsall Corporation ... ... ... | 4,022 | 3,315 | 3,405 | 3,585 | ... | 3,691 | 3,342 | 3,400 | 3,534 | ... | 22 | 76,092 | + 1,170 |
| Walthamstow Corporation ... ... | 2,511 | 2,457 | 2,462 | 2,624 | ... | 2,362 | 2,407 | 2,496 | 2,533 | ... | 21½ | 54,220 | — 115 |
| Warrington Corporation ... ... ... | 1,309 | 1,279 | 1,286 | 1,315 | ... | 1,339 | 1,335 | 1,334 | 1,350 | ... | 22 | 34,271 | + 1,309 |
| West Ham Corporation ... ... ... | 6,060 | 5,954 | 6,052 | 6,169 | ... | 5,773 | 5,635 | 5,918 | 5,884 | ... | 21½ | 130,054 | + 1,514 |
| Wolverhampton Corporation ... ... | 7,197 | 5,894 | 6,328 | 6,132 | ... | 6,712 | 5,625 | 5,872 | 5,824 | ... | 22 | 131,141 | — 4,337 |
| York Corporation ... ... ... | 1,547 | 1,582 | 2,029 | 1,759 | ... | 1,602 | 1,594 | 2,078 | 1,773 | ... | 23 | 35,795 | + 1,609 |

## Underground Electric Railways Company of London, Limited.

| NAME OF COMPANY | 1929. WEEKS ENDING Aug. 10 | Aug. 17 | Aug. 24 | Aug. 31 | ... | 1930. WEEKS ENDING Aug. 9 | Aug. 16 | Aug. 23 | Aug. 30 | ... | AGGREGATE. Wks. | 1930 | Increase or Decrease |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Underground Rlys. (Common Fund Co.) | 295,000 | 280,200 | 278,400 | 290,600 | ... | 293,700 | 288,100 | 290,900 | 295,600 | ... | 35 | 10,526,700 | + 614,100 |
| London and Suburban District ... ... | 45,600 | 43,600 | 42,600 | 44,900 | ... | 44,200 | 43,900 | 44,300 | 45,500 | ... | 35 | 1,545,000 | + 100,300 |

## Colonial and Foreign Tramway Traffic Returns.

| NAME OF COMPANY OR CORPORATION | 1929. WEEKS ENDING Aug. 10 | Aug. 17 | Aug. 24 | Aug. 31 | ... | 1930. WEEKS ENDING Aug. 9 | Aug. 16 | Aug. 23 | Aug. 30 | ... | AGGREGATE. Wks. | 1930 | Increase or Decrease |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Anglo-Argentine ... ... ... ... | 84,606 | 81,598 | 84,453 | 82,455 | ... | 80,394 | 75,140 | 76,654 | 71,854 | ... | 35 | 2,881,383 | — 134,503 |
| Buenos Aires Lacroze ... ... ... | 11,338 | 11,516 | 11,750 | 11,645 | ... | 10,880 | 10,913 | 10,651 | 10,913 | ... | 9 | 94,744 | — 8,322 |
| Calcutta ... ... ... *Rupees* | 126,048 | 132,919 | 124,717 | 121,393 | ... | 108,338 | 107,712 | 107,938 | 103,356 | ... | 34½ | 3,865,927 | — 543,336 |
| Madras (2 weeks) ... *Rupees* | ... | 46,482 | ... | 45,618 | ... | ... | 48,656 | ... | 47,245 | ... | 34 | 741,958 | + 37,253 |

| | 1929. Mar. | April | May | June | July | Aug. | 1930. Mar. | April | May | June | July | Aug. | AGGREGATE. Mths. | 1930 | Increase or Decrease |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Brazilian Trac. $ | 3,928,550 | 4,042,145 | 4,206,895 | 4,210,893 | 4,335,895 | 4,333,460 | 4,047,036 | 4,127,492 | 4,304,160 | 4,146,884 | 4,081,018 | ... | 7 | 28,367,377 | — 5,543 |
| British Columbia $ | 1,243,592 | 1,205,482 | 1,165,279 | 1,133,017 | 1,156,720 | ... | 1,258,375 | 1,213,993 | 1,203,292 | 1,144,585 | 1,196,239 | ... | 1 | 1,196,239 | — 39,519 |
| Burma ... Rs. | 68,993 | 64,744 | 66,077 | 63,157 | 64,649 | 61,309 | 72,758 | 65,482 | 66,320 | 66,317 | 66,444 | ... | 12 | 776,289 | — 17,071 |
| Cape Town ... | 30,121 | 29,244 | 29,366 | 27,995 | 27,779 | 27,639 | 30,087 | 27,500 | 27,286 | 25,525 | 24,953 | ... | ... | ... | ... |
| Carthagena & H.... | 853 | 1,063 | 725 | 1,476 | 1,100 | 1,169 | 1,003 | 905 | 552 | 515 | 738 | 505 | 8 | 6,855 | — 1,235 |
| Durban ... ... | 24,442 | 25,603 | 24,518 | 24,308 | 29,110 | ... | 23,662 | 24,002 | 23,945 | 23,440 | 27,049 | ... | 12 | 288,972 | — 3,643 |
| East India ... | 3,892 | 3,798 | 3,862 | 3,772 | 3,801 | 4,152 | 3,863 | 3,601 | 3,698 | 3,803 | 3,833 | 3,948 | 1 | 3,948 | — 204 |
| Kalgoorlie... ... | 1,682 | 1,673 | 1,747 | 1,660 | ... | ... | 1,710 | 1,718 | 1,815 | ... | ... | ... | 5 | 8,134 | — 68 |
| Para ... ... | 14,971 | 15,060 | 15,182 | 15,450 | 15,044 | 15,221 | 14,976 | 15,564 | 15,568 | 15,028 | 14,816 | ... | 8 | 118,623 | + 521 |
| Port Elizabeth ... | 7,857 | 7,877 | 7,601 | 7,335 | 7,503 | 7,402 | 8,127 | 7,521 | 7,552 | 6,951 | 7,045 | ... | ... | ... | ... |
| Rangoon ... Rs. | 121,246 | 120,855 | 121,040 | 114,535 | 122,630 | 123,550 | 164,600 | 148,215 | 149,440 | 142,170 | 151,300 | 146,320 | 8 | 1,197,255 | + 242,264 |
| Shanghai ... $ | 339,785 | 336,624 | 339,833 | 335,740 | 329,139 | 335,172 | 377,849 | 308,840 | 183,409 | 367,231 | 145,000 | ... | 7 | 1,368,000 | + 154,000 |
| Singapore ... $ | 133,000 | 131,000 | 133,000 | 123,000 | 131,000 | 130,000 | 143,000 | 137,000 | 148,000 | 140,000 | ... | ... | 9 | 1,223,000 | + 140,000 |
| Winnipeg ... $ | 572,492 | 536,033 | 534,954 | 517,738 | 497,935 | ... | 571,157 | 516,132 | 509,709 | 479,958 | 452,212 | ... | 7 | 3,725,716 | — 112,297 |

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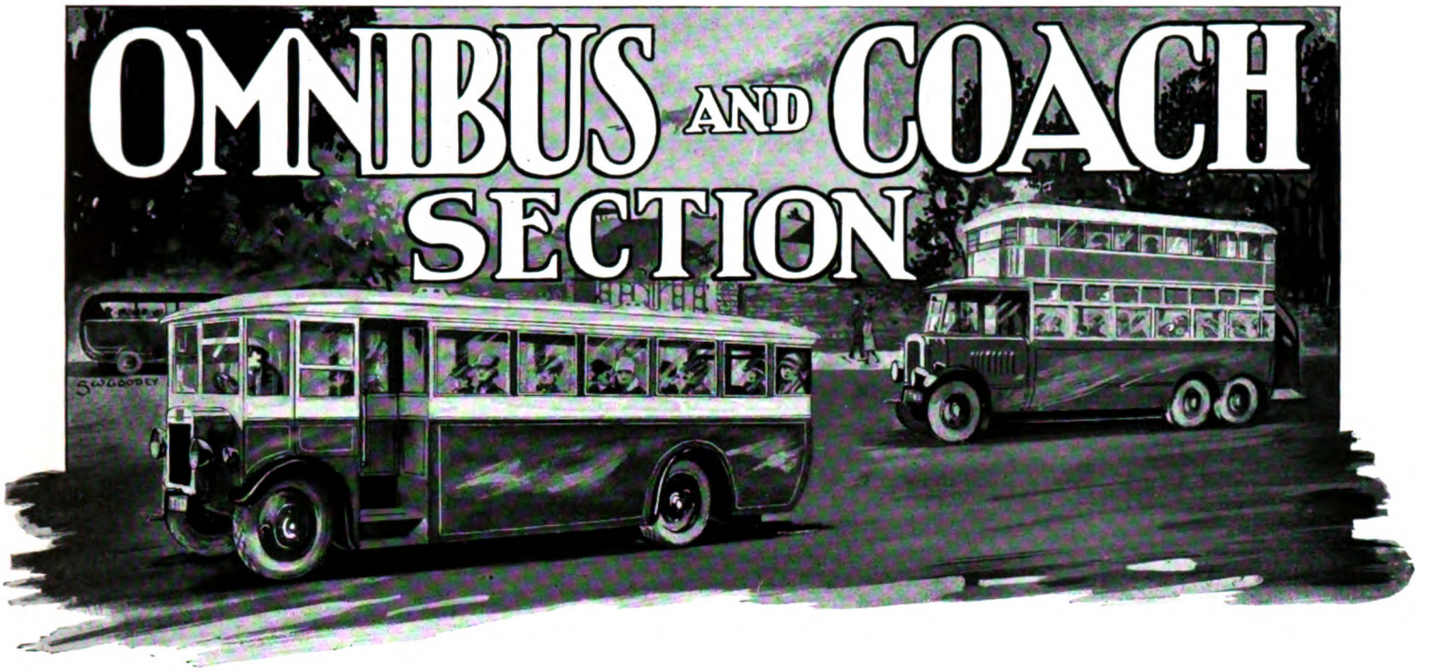


**OMNIBUS AND COACH SECTION—TWENTY-FIFTH YEAR OF PUBLICATION.**

### PROVISIONS TO SECURE SAFETY.

During some week-ends this summer there have been more fatalities to passengers in all classes of road vehicles than have occurred in a year on the railways. Unfortunately public vehicles sometimes figure in these mishaps, the most frequent causes of which are collision, overturning from several causes, including skidding, and fire. Notwithstanding all that is done to inculcate drivers with a zeal for carefulness by means of the booklet issued with driving licences and by warnings from employers, the number of collisions tends to increase. As to skidding, it would seem to be possible, bearing in mind what has been accomplished in some places, to provide road surfaces that will lessen the risk. The tendency to skid is increased by the dropping of oil and grease from sumps, differentials and various lubricating points. Some of the mess might be prevented by a reversion to the trays that had to be fitted to early omnibus chassis in London. Fire is the most serious problem. One cause of an outbreak is a blow-back from the engine, usually caused by a stuck inlet valve. Often the outbreak can be subdued quickly by turning off the supply of petrol to the carburettor. The tap for this ought to be mounted on the dashboard. More fires occur on private cars than on public passenger vehicles, because the petrol tank in many of the former is under the bonnet or the dashboard. Concurrently with the collision causing a leak, a spark fires the vapour. On large private cars the tank is placed at the rear, and is further protected by the spare wheel. Opinion differs as to whether public vehicles should have the tank at the rear or on the off-side, as is now largely the case. Whichever position is adopted the tank might be guarded by a shield. An auxiliary tank near the engine should give place to a mechanical pump. One emergency door should certainly be at the rear, and the safety of the driver on forward-drive vehicles seems to need more attention. The use of non-splinterable glass ought to be compulsory.

### THE LIMITED EXPRESS COACH.

The acquisition by the London General Omnibus Company of a site near Oxford Street as a station for their Green Line coaches, draws attention to a form of road passenger service which until recently was little known, although very popular with those who had formed its acquaintance. It may be termed a super-omnibus service, placed between the private motor car and the ordinary public omnibus, as it has some of the privileges of the first and fewer of the inconveniences of the second. It is sometimes termed the limited express, a very apposite description, because its stops are less frequent than those of the ordinary omnibus, and it travels faster between points. Its seating accommodation is as roomy and comfortable as that of the private car ; and the fares generally are lower than those of the railway to the same place, but higher than the omnibus fares. In London its line of development is in providing comfortable accommodation for travellers to the country districts and small towns, places averaging a run of about thirty miles, north, south, east and west of London. Its popularity is assured. Business people are attracted by low season ticket rates, shoppers form another large source of fares, and there are always many pleasure seekers who enjoy a run into the country without any fuss or trouble. The time taken is not so much longer than by railway, when taking into consideration that these coaches pick up and set down passengers at more central parts of London than the railways can reach, while in the districts served they will stop for passengers getting on or off at the point nearest home. Many companies are operating such services between London and the outlying districts, and the fact that the Green Line is to have a station adjacent to the busy shopping centre and in the heart of business London, shows that development may be anticipated. The Green Line coaches are becoming more and more familiar on the streets of London, and their popularity will undoubtedly continue to grow.

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# OMNIBUS AND COACH SECTION

## THE MODERN COACH

One of the most rapid and astonishing developments connected with the internal combustion engine during the last ten years has been the evolution of the motor-coach. It was but a short while ago that long-distance public passenger service was carried out on the public highways by vehicles which compared with the modern coach seem almost as crude and inadequate as the early motor-car. The charabanc of the post-war period was a cumbersome monstrosity mounted high on a chassis which swayed dangerously on corners, and, owing to its solid tyres and inadequate springing, provided little in the way of comfort for its occupants. Its road speed was necessarily limited by these factors and by the lack of four-wheel brakes. Moreover, few, if any regular services were run to time-table, since the demand had not yet arisen, and the traffic consisted chiefly of seasonal round trip excursionists visiting the coast or inland places of interest. On the whole the general public regarded these vehicles with annoyance and distrust. Such was the position when the charabanc first became a commercial possibility. Now developments in automobile suspension and braking, combined with advance in engine and body building, have together produced the modern coach capable of providing for the passenger the comfort of a private car at speeds of fifty miles an hour or over. Increasing competition has replaced small individual proprietors by large undertakings which, quick to seize the opportunity offered by the lethargic policy of the railways, have created a demand for long-distance road services, and have covered the country with a network of routes on which regular services run throughout the year. In order to compete successfully with the railways, motor-coaches must maintain as high an average speed as possible. Whereas the railway train runs on its own track, unhindered save by traffic of its own kind, the motor-coach utilises the public highway, which was not designed for this type of traffic, and already at certain times, carries as much as it can safely bear. It requires little imagination to see that a motor-coach running to schedule on a crowded road may be a danger to all other users. Annoyance and distrust on the part of the latter have already given way to active hostility. Evidence of this is forthcoming in almost daily communications to the press, one of which will be found in this issue. Mr. Valentine Knapp, in a letter to *The Times* of September 1, raised the question of the legal control of this excessive speed of motor-coaches. A simple and effective method of regulation is provided by the new Road Traffic Act. Under Section 10, Sub-section 6 of the Act the publication of a time-table which is not practicable without infringement of the speed limit applicable to the type of vehicle in use, may be taken as *prima facie* evidence that the employer "procured or incited the persons employed by him to drive the vehicles to commit an offence under this section." It is to be hoped that operators will, in their own interest, give voluntary attention to this aspect of what has now become an important public service. Legal compulsion in the glare of publicity will diminish the goodwill of the public to which the industry must eventually owe its success.

## THE ROAD TRAFFIC ACT.

DATES UPON WHICH THE FIVE PARTS COME INTO OPERATION.

The Minister of Transport has made a statement in which he gave approximate dates on which the various parts of the Road Traffic Act will come into operation. Mr. Morrison's statement is as follows:—

A number of regulations have to be made and machinery has to be set up before the Road Traffic Act can be brought fully into operation. A statutory obligation is also placed on me to consult with representative bodies before any regulations are made. I cannot, therefore, at the moment, although I am most anxious to avoid any unnecessary delay, give a definite undertaking as to the dates on which the various provisions of the Act will become operative. The dates which I have in mind and to which I shall work, are approximately as follows:—

Part I.—I have given anxious consideration to the question of the date at which the change in the law as to speed limits can most conveniently operate and have come to the conclusion that this should be January 1 next. By that date I hope that it may be possible to issue the Highway Code and local authorities will have had reasonable time to consider and arrange for the organisation of mobile police units as contemplated by the provisions of the Act. As regards the remainder of Part I, I have in mind the first of November. It would hardly be practicable to make the necessary Regulations with regard to the form of the driving licence and applications for licences and declarations as to physical fitness, and also to make arrangements for these documents to be printed in large numbers and made available for licensing authorities before that date.

Part II, which deals with cover against third party risks, should come into operation on January 1, 1931, the date which is the beginning of the licensing year for motor vehicles.

Part III (amendment of the law relating to highways) on November 1, 1930.—I attach great importance to the highway code, and shall lose no time in bringing it into force, but as it will affect all classes of road users whose views I shall have to take into account, and as in addition it requires an affirmative resolution by both Houses before coming into force, it is impossible for me to indicate precisely the date on which the code will itself become operative.

Part IV (Regulation of Public Service Vehicles).—I propose that the sections of this part of the Act, which provide the necessary machinery for the appointment of the Traffic Commissioners, etc., should come into force on November 1; as also the sections giving the Traffic Commissioners when appointed the necessary powers to execute their duties, consider applications for licences, etc. The requirement, however, that omnibus and motor coach services cannot be operated except under a road service licence granted by the Commissioners will not become operative before March 1, 1931, at the earliest. The bringing into force of this part of the Act will entail the use of my powers to make transitory provisions.

Part V of the Act, which deals with the operation of municipal omnibus services, I propose shall come into force on January 1 next.

## NEW ROAD MATERIAL FOR LEEDS TRAMWAYS.

Leeds Tramways Department is laying down a new road material which is said to be practically indestructible, to be non-skidding, and to reduce noise. Its basis is silica and bitumen. It has already been tested in various parts of Leeds during the past eighteen months, and it is now being laid on a mile of track in Dewsbury Road. The Tramways Department believe it is the ideal material for surfacing that part of the road for which they are responsible. Mr. R. L. Horsfield, the general manager of the tramways, says that being laid cold, it is ready for traffic in a few hours, and it can be laid in all weathers.

## DISUSE OF RAILWAY BRANCH LINES.

More than 50 branch-line stations of the London and North Eastern and London Midland and Scottish Railways were closed to passenger traffic on September 22. Wherever the branch lines are closed, omnibus services will be substituted either by the railway company or by the road transport company with which the railway is associated. Most of the lines will still be used for goods traffic.

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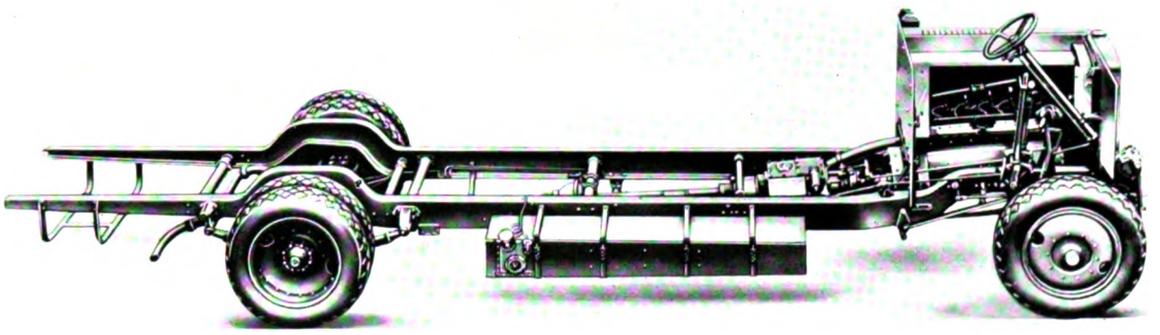
# OMNIBUS AND COACH SECTION

## GUY LONG DISTANCE COACH.

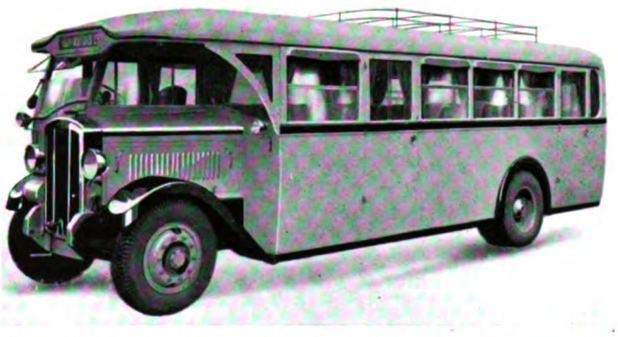
THE CHASSIS AND THE LUXURY AND SERVICE OMNIBUS BODIES.

Although the "Conquest" chassis manufactured by Guy Motors, Ltd., of Wolverhampton, has for several years held a leading position with numerous operators, both for long distance and general service work, the makers have not ceased to introduce improvements. These have been based upon increasingly severe tests carried out either by Guy Motors, Ltd., or by the operators who have been quick to adopt the "Conquest" as a luxury coach comparable with the high-class private car. On the mechanical side, too, there are attractive features. One is the six-cylinder engine, of which type Guy Motors, Ltd., claim to be the pioneers for public passenger work. Features of the chassis are ease of accessibility of the patented engine and its components, ultra efficient brakes and the greatest possible riding comfort.



The "Conquest" Chassis of Guy Motors, Ltd.

With R.A.C. rating of 38.4 H.P., the six cylinders have a bore of 4 in. and 5½ in. stroke, and the output ranges from 50 to 85 H.P. The valve gear is totally enclosed by quickly removable aluminium covers having thumb screws. It is claimed that the patent detachable cylinderhead enables the valves to be placed more favourably for free passage of gases then either the "over type" or the "side type." The valve stems are automatically lubricated; the ignition plug is ideally situated above the centre of the piston. The crankshaft has seven bearings and the camshaft eight. To obtain accurate location and to ensure silent running the intermediate timing gears are mounted on adjustable centres. Water cooling is by pump and an efficient fan with thermostat in circuit.



26-seat Long Distance Coach on "Conquest" Chassis.

Only a few minutes' manipulation of nuts is needed for the removal of the cylinder heads to expose the valves, combustion chambers and pistons for cleaning. The removal of the heads does not necessitate the dismantling and re-adjustment of the valve gear.

THE FLEXIBLE SUB-FRAME.

An important feature of the chassis is the Guy patent flexible sub-frame which, with its independent movement, relieves the main frame of the stresses and twists that are likely to occur when traversing uneven roads. The sub-frame is mounted universally at three points between the main frame members, and on this sub-frame the engine, clutch and gear-box are carried. Thus the vital working units are insulated from the risk of main frame distortion and no strain is placed upon the crankcase and gear-box arms.

The single disc fabric lined clutch has multiplying levers and clutch stop. Concerning the gear-box it is found that the additional centre bearings to the lay shafts prevent deflection and give much quieter gears. Adjustment of the selector mechanism can be effected without opening the box or draining the oil. All gears are accurately mounted on splined shafts, case-hardened and ground to a high degree of accuracy. The ratios of the four speeds, forward and reverse, are as appended:—Fourth, 5.75; third, 9.08; second, 13.05; first, 24.3; reverse, 23.3. Right hand change is provided for both the forward and beside-the-engine driving positions. There is provision for working a speedometer, governor and tyre pump.

The propellor shafts are dynamically balanced. Oil from the gear-box automatically circulates to the stationary cover, and forms an oil bath for the front universal joint. The central and rear universal joints are also automatically lubricated.

The under type worm-driven rear axle is fully floating, the weight of the vehicle and load not being carried on the axle shafts. By withdrawing the shafts, which are attached to the hubs, and disconnecting the rear universal joints, the whole of the axle can be removed without jacking the vehicle or using a pit. Adjustable roller bearings are fitted throughout.

Steering is of the cam and roller type and the steering column can be raised at different angles to suit various types of body. The strong tubular side and cross steering rods form oil reservoirs with wick feed to the ball joints, replenishment with oil being needed only after many thousands of miles running. The front axle is made from high tensile alloy steel of H section. Swivel pins have renewable bushes, and the wear on the heads is taken on thrust bearings. Swivel pins are lubricated from the oil reservoir above the swivel. Adjustable roller bearings are fitted.

An important advantage is claimed for the underslung rear springs. As the axle is horizontally in line with the fixed end of the spring, axle movement, either way, is practically vertical, thus eliminating the possibility of the axle being thrown out of alignment when traversing rough roads.

Four-wheel brakes are provided, the patented Duplex type giving twice the normal width of shoes. Servo assisted foot-brakes

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# OMNIBUS AND COACH SECTION

operate on front and rear wheels, and an independently operated hand brake on the rear wheels.

The chassis weight, including all equipment, is 3 tons 6 cwts. The dropped frame is of pressed nickel steel substantially braced with tubular cross members. All bolts are of nickel steel. There is high pressure oil gun lubrication with centralised oiling galleries. Chief chassis dimensions are subjoined :—Wheelbase, 16 ft. 7 in.; track: front, 5 ft. 10 in., rear, 5 ft. 8¾ in.; dash to end of frame 19 ft. 8½ in.; dash to rear axle centre, 13 ft. 1¾ in.; height to top of frame (laden), 2 ft. on 36 in. tyres; turning circle, 58 ft.; ground clearance 10 in.; overall length 25 ft. 2¾ in.

### Long-Distance and Service Omnibus Bodies.

Any type of body can be supplied, but it is of interest to notice briefly two productions for long distance and general omnibus work. For the former the seating capacities are 26 and 32. The general framework is of the best selected ash, and the floor of best quality red deal boards is covered with best quality ⅜ in. composition lino, edged with aluminium beading, and best quality pile carpet fitted down the central gangway. The roof is of best quality ash sticks, flitched with sheet metal, and covered and lined with 4 mm. birch plywood. The exterior roof is covered with moleskin, bedded in and well coated with white lead, finished with white lead paint.

Service Omnibus on Guy "Conquest" Chassis.

Exterior panels of the body are of 16-gauge aluminium sheeting, the panels extending to the level of the bottom step. The interior panels are of three-ply birch from the window rail to seat rail, covered with best quality repp to match the trimming. Interior finish comprises figured mahogany capping to all waist rail window fillets, cantrail and pillars. The camber of the roof is lined with roof cloth, its colour being in accordance with the interior colour scheme. Lincrusta panel is fitted to the centre of the roof, and art silk curtains to all windows.

Seats are of the de luxe type, providing the utmost comfort throughout the longest journey. Each seat has two head rests. A hinged table is fitted flush in the seat back. For the driver the greatest possible comfort is provided in this half type cab, with full width canopy. A three-piece sloping metal screen allows free ventilation of the cab. The centre portion opens outwards, can be secured in any position, and is designed to give a clear vision. To facilitate engine maintenance the near side and front of the cab are detachable. At the front and rear of the near side are coach-built doors, fitted with flush-fitting handles. In the roof and by means of the windows adequate ventilation is provided.

Bodies for service omnibuses comprise saloons seating from 32 to 35 persons, these standard types being used by many corporations and companies. The materials for the most part are the high quality materials referred to in the case of the long-distance vehicles. The bottom sills are constructed to give a low load line, and the height of the underside of the floor from the top of the frame is only 2⅜ in. Trap doors are provided in the floor for easy access to the chassis. Seating and ventilation in the saloon and in the driver's compartment are all that can be desired. By means of the Rawlings cam type gear passengers can adjust the windows to any position. In the roof there are two Airvac ventilators; in the front bulkhead and in the driver's cab are hit-and-miss ventilators.

A feature of the service omnibus bodies is the Guy emergency door, in addition to the double folding door at front or rear, or at front and rear. The emergency door is offered as being fool proof and quickly operated from three different positions, namely, by the driver from his seat, from outside the vehicle, and from the interior by the passengers.

## NEWTEX SAFETY GLASS.

Remarkable progress has been made during the past year in the development of the Newtex Safety Glass Company, of Agnes Road, Acton, London. Some eighteen months ago, Mr. John Newton, the managing director, who is also the head of the well-known glass firm of John M. Newton & Sons, Ltd., informs us that he decided to completely reorganise the Newtex works in order that the company should be in a position to meet the great demand for safety glass, which was anticipated. With this end in view, Mr. W. C. Dougan, an expert on the manufacture of safety glass, was appointed works manager and engineer, while on the sales side, Mr. Ernest Baker, who for 20 years was the chief representative of John M. Newton & Sons, Ltd., was placed in charge of the selling organisation.

As a result of the Metropolitan Police Order with regard to motor-coaches, which made the fitting of safety glass to wind-screens on all vehicles presented for licensing in the Metropolitan Police District compulsory after July 1, the Newtex works are at full capacity, and as the excellence of the quality of the Newtex safety glass is now being so widely demonstrated, a considerable demand for coach, omnibus and tramcar windows is maturing.

Among the special claims made for Newtex safety glass are that it is made with an acetylated film which cannot discolour even under tropical conditions, it is sold under a guarantee that it will not bubble, blister or disintegrate, and as the Newtex process enables the making of large plates, the manufacturers of omnibus coaches or tramcars have no limitation in design.

## AMERICAN OMNIBUS REGULATION.

### The Parker-Couzens Bill

When the U.S.A. Congress adjourned for the autumn, the Parker-Couzens Bill for the regulation of inter-state omnibus traffic was among the unfinished business, although strenuous efforts were made to bring it before the Senate for passage. It was, however, blocked by the opposition, which regards the measure as a movement by railroad companies to gain control of the omnibus lines. The Bill will come up again when Congress meets on December 1. A review of the provisions of the Bill appeared in The Tramway and Railway World of July 17.

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# OMNIBUS AND COACH SECTION

## RANSOMES' TROLLEYBUSES IN BELGIUM.

INAUGURATION OF A LIÉGE-COINTE SERVICE.

The interest which is being evinced on every hand in the progress of the trolleybus was exemplified at the official inauguration on Saturday, August 9, by the Société Anonyme des Tramways Unifiés de Liége et Extensions, of a new trolleybus service between Liége and Cointe.

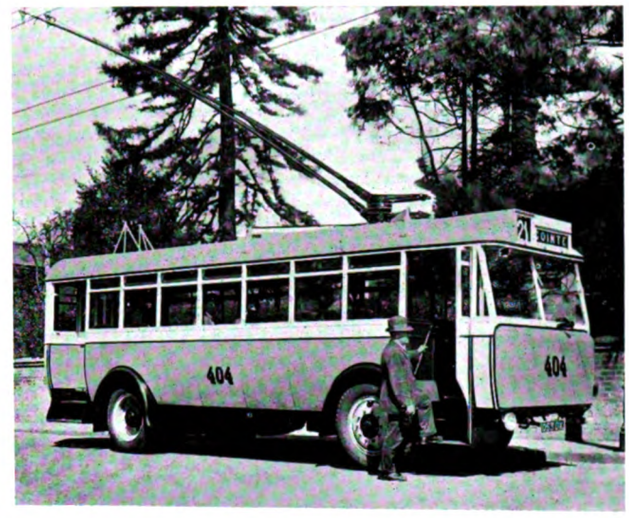
The five vehicles now in service were supplied by Ransomes, Sims & Jefferies, Ltd., of Ipswich, and are shown in the accompanying illustrations. These vehicles are of the four-wheel single-deck saloon type and were built throughout at the company's works at Ipswich. The Ransomes trolleybus is a fine example of the modern public service vehicle. The body is designed to seat 30 passengers and to carry a further 30 standing. The vehicle is arranged for either one or two-man operation, and each is fitted with Englebert S.S. pneumatic tyres.

OPERATORS' SATISFACTION—THE MAKERS COMPLIMENTED.

The official inauguration of the new route at Liége was attended by many notabilities, including the Chief of the Belgian Ministry of Transport, various Liége city officials, and many of the leading tramways officials in Belgium. After an address of welcome by M. Nyst, President of the Board of Directors, details of the system and the reason for its adoption were given by M. Harmel, Director General of the Tramways Unifiés de Liége.

In the course of his remarks M. Harmel made reference to the success which had been achieved by trolleybuses in other countries, and to the fact that this class of vehicle had replaced tramways entirely in some English towns. The new trolleybus route—Liége-Cointe—had been in operation since July 30, maintaining a 15-minute service in the mornings and 10-minute service in the afternoons. The route had been served since that date solely by trolleybuses, which had decidedly met with public favour and were bringing in increased revenue. The management were quite certain of being able to increase the frequency of the service without increasing the number of vehicles.

The guests were then taken to the city terminus of the new trolleybus route in La Place du Roi Albert, and were driven out to Cointe and back again in two of the vehicles. All were highly impressed with the running, and the ease with which the trolleybuses were manœuvred over what may be considered difficult route. Their smooth, silent, and speedy running were the subject of favourable comment; the company were also impressed by the interior fittings and finish.




Front view of Liége Trolleybus.

At luncheon at the Hotel des Boulevards, various speeches were made and the makers of the trolleybuses were referred to in complimentary terms.

FEATURES OF THE VEHICLE.

In common with all Ransomes' trolleybuses, the Liége vehicles incorporate certain patented features of design conducing to long, trouble-free, and profitable service. As an example, the trolley bases are carried by the patent sub-base, which is a departure from the usual method of carrying the booms. With this improved method the roof is relieved of heavy stresses and strains during the operation of the booms, and more especially if the trolleys become de-wired. The construction adopted has the effect of strengthening the roof and body.

The back axle has formed the subject of special attention and design, and is an exceptionally fine piece of work. It is forged from a steel billet and is of the basin type for receiving the differential gear.

Each driving wheel is fitted with two independent internal expanding brakes acting on large diameter drums, and front-wheel brakes are also provided. Incorporated in the braking arrangement is Ransomes' patent cam gear, which offers unique advantages over the orthodox arrangement.

Provision is made to allow passengers to signal the driver to stop, each pillar being fitted with a push-button connected to a red lamp in the driver's cab, and also to one on the front bulkhead of the vehicle, enabling the passenger to observe the signal.

The Liége trolleybuses may be described as the most luxuriously equipped passenger vehicles in use in Belgium, and both the interior and exterior finishes are most pleasing.

Ransomes, Sims & Jefferies, have recently received an order for twenty chassis for Rotherham Corporation, their vehicle having been selected after tests with other makes, and they have also lately received repeat orders from Ipswich Corporation and Medellin (Colombia).

Rear view of Trolleybus supplied to Liége by Messrs. Ransomes, Sims & Jefferies, Ltd.

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# OMNIBUS AND COACH SECTION

## THE FIRST COMPLETE "MONITOR" OMNIBUS.

A 48-Seater for Huddersfield Corporation and the L.M.S. Railway.

Illustrations and a description were given in The Tramway and Railway World of August 14 of the new four-wheel chassis which Karrier Motors, Ltd., have introduced under the name of the "Monitor" for carrying a double-deck body to accommodate from 48 to 50 persons. It has been designed to allow of the provision of adequate room for each seat, and is propelled by the new six-cylinder Karrier engine of 75–122 H.P.

On this page is shown the first completed vehicle on this type of chassis, a 48-seater to the order of the Huddersfield Corporation Tramways, which undertaking operates their omnibuses in conjunction with the London, Midland and Scottish Railway Company.

The bodywork, by Park Royal Coachworks, Ltd., is finished in

Huddersfield Corporation 48-seat Karrier Omnibus with "Monitor" Chassis.

the Corporation's standard colours of maroon and cream, and on both lower and upper decks twenty-four passengers are carried.

On the lower deck, ten pairs of seats—well-sprung and upholstered in moquette and leather—face forward, whilst on each side over the wheel-arches a pair of seats face inwards. All the seats on the upper deck face forward, and these are upholstered in red leather.

Due to the fact that there are only six rows of seats in the upper saloon, the amount of knee-space is such that it is possible for a person to sit on the knees of a comfortably-seated passenger without one's knees being inconvenienced by the seat in front.

The body is amply ventilated, there being two half-drop windows on each side of the upper and lower decks, the windows being finished with aluminium louvres in each case. The driver's canopy is of the fully-floating type, built with the near-side section detachable to facilitate the overhaul of the power-unit or its removal.

The finished vehicle is of attractive appearance and is on similar lines to the "Consort" six-wheel omnibuses of which this municipal undertaking has recently taken delivery. Incidentally, the price of the "Monitor" chassis complete has been fixed at £1,150.

**New Omnibuses for Aberdeen.**—At a meeting of Aberdeen Town Council a discussion took place on the recommendation of the Tramways Committee for the purchase of fourteen 52-seat double-deck omnibuses. The Committee adhered to its recommendation that fourteen Crossley chassis should be bought, but the Council decided that fresh tenders should be asked from coachbuilders in Aberdeen and elsewhere.

## HARROGATE FACILITIES FOR ROAD TRAVEL.

Dependent as it mainly is upon the patronage of visitors, Harrogate has long enjoyed the use of the best products of the omnibus and coach builder, and the licensing of the large fleet of vehicles which are at the service of the public has been most carefully attended to by the Corporation. As the borough is without tramway facilities the work of the licensing committee has been greatly simplified. Their object has been to save the principal thoroughfares from congestion while ensuring adequate means of communication between the town and surrounding districts. Great care has been exercised in the granting of licences for long-distance services which are valuable to the townspeople and visitors.

Perhaps the best method of summing up the work of the licensing authority is to state that the names of a long list of towns linked up with Harrogate appear in the current issue of "Roadway Time Tables," published by Roadway Time Tables, Bookings and Publications, of Roadway Corner, Warwick Street, W.1. In many cases the service is direct; in others changes have to be made at convenient places. Express services are run to and from Birmingham, Blackpool and Morecambe, London and Scarborough; also to and from Harwich via London. Bookings are given to many of the large number of intervening towns on the express routes.

The operators of the daily express services are as follow:—West Yorkshire Road Car Co. (in conjunction with Yorkshire [W.D.] Electric Tramways and Yorkshire Traction Co.) to Birmingham, Blackpool, Morecambe, London and Scarborough. There are also one or more general services to Bolton Abbey, Boroughbridge, Boston Spa, Bradford, Helmsley, Ilkley, Kirby Overblow, Knaresborough, Leeds, Liverpool, Manchester, Middlesbrough, Newcastle, Nottingham, Otley, Pateley Bridge, Pool, Redcar, Ripley, Ripon, Sicklinghall, Stockton, Wetherby, York, and elsewhere. The companies providing the general services are the West Yorkshire Road Car Co., B. & B. Tours, Ltd., the United Automobile Services, Harrogate Carriage Co., the North-Western Road Car Co., in conjunction with the Northern General Transport Co., Central Motor Coach Services, Leeds-Newcastle Omnibus Co., Redwing Safety Services, etc.

## AN ENGINE FOR GARAGE OWNERS.

Power from Waste Oil.

Tangyes, Ltd., of Birmingham, have issued new publications describing and illustrating their latest two-stroke vertical fuel-oil engine. This engine is made in three sizes—2½, 4 and 6 brake horse power. It is specially designed to use cheap fuel oils, and the cost of running is remarkably low, especially in comparison with petrol or paraffin. A still more important feature that should appeal to the garage owner is the fact that waste oil can be used so that the accumulation of waste oil from the sumps of cars, etc., are available as fuel. The 4-H.P. engine develops its full working load for eight hours at a fuel cost of 1s. 3d.; on paraffin the cost is 2s. per eight hours. Considering that the usual cost of running vertical engines on petrol is 4s. 8d. per eight hours and on paraffin 3s., the saving is thus 3s. 5d. against petrol and 1s. 9d. against paraffin. A 6 H.P. Tangye engine is running ten hours a day at Mucklow's Hill Garage, near Halesowen, and generating the electricity for lighting the whole of the garage and charging accumulators, etc., entirely on waste oil.

Special attention has been given to the production of a strong and simple engine that can be safely entrusted to unskilled attendants. The specification includes a highly sensitive governor which accurately regulates the supply of oil strictly in proportion to the load of the engine. A small vaporiser is incorporated with the cylinder-head, and is designed to allow for expansion to avoid possibility of cracks. It is heated by lamp before starting, but this takes only a few minutes, when the heat is sufficient to fire the charge on all loads. The crankshaft, properly balanced, runs in white metal bearings and is designed to ensure accessibility and to prevent loss of oil and compression through leakage. The fuel oil pump is controlled by an automatic crankshaft governor. Lubrication is automatic, and an oil groove round the bed assures a clean engine-room floor.

The overall dimensions are: height, 31, 36 and 40 in. for the 2½, 4 and 6 H.P. respectively; width over crankshaft, 30, 35 and 38 in.; depth, 26, 28 and 32 in.; and the net weights are 4, 4½ and 8 cwt.

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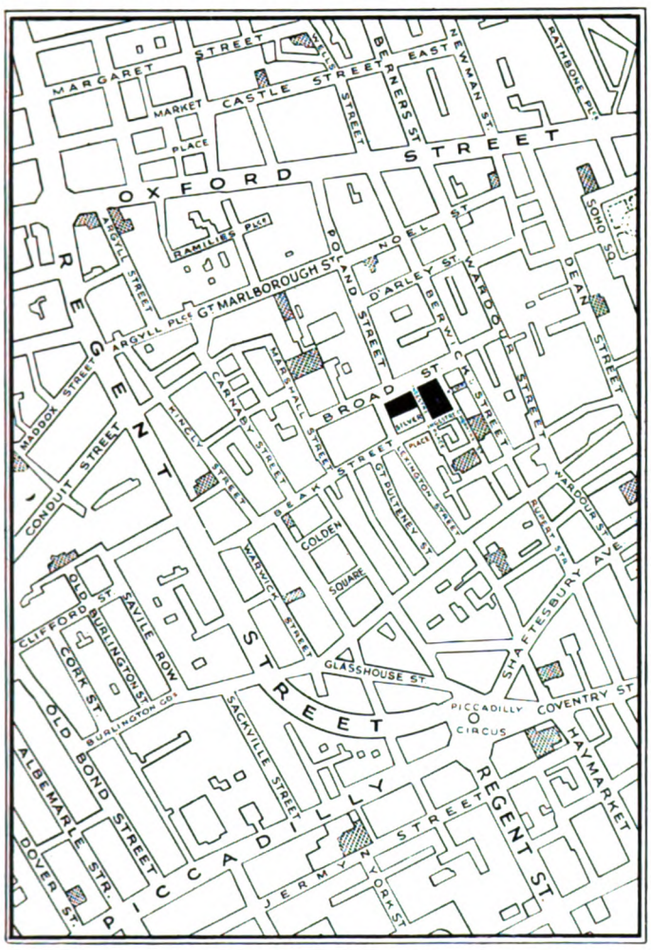
# OMNIBUS AND COACH SECTION

## NEW COACH STATION FOR LONDON.

THE L.G.O.C. TO ESTABLISH A CENTRE FOR EXPRESS SERVICES.

Reference has already been made in these columns to the steps taken by the London General Omnibus Co. to protect their omnibus traffic on country routes from the rivalry set up by independent coach owners who pick up passengers for intermediate stages. At holiday periods there are more than one hundred country routes in operation, and at any time the traffic is too valuable to be surrendered. Bold measures were therefore decided upon after a successful experiment in running an express coach between Watford and Golders Green, where communication was given with the underground railway to Charing Cross. Before long, this service will have extended to one hundred coaches of the admired "Regal" pattern




Map showing Situation of Proposed Coach Station for L.G.O.C. Express Services.

of the Associated Equipment Co. A considerable number are already in service, the first with scarlet exteriors bearing the names of the L.G.O.C., and their associated organisations the East Surrey Traction Co., of Reigate, and the Autocar, of Tunbridge Wells.

Towards the middle of July these concerns were merged into a new venture known as The Green Line, which is to work all the express vehicles. "Regal" single-deck vehicles are retained, but the exteriors are dark green in colour. The result is that London has at last been given express communication with the Home Counties equal to anything that can be found in the provinces. Gradually these services will be extended so as to cover all the country routes, the first of which were opened by the L.G.O.C. as far back as 1913.

In consequence of the lack at present of suitable station accomodation on private land, the Green Line services must for some time continue to use the congested Victoria Embankment as a starting and arrival place. The management recognise that their patrons have no liking for this course, which also militates against the proper control of the services. Consequently the company has purchased in the heart of Soho a site upon which a coach station is to be erected. This innovation will provide passengers with facilities for joining and leaving the coaches in as convenient an area as could be desired.

The site of the station is in Broad Street, a thoroughfare that is in keeping with its name, and moreover is only a few hundred yards from Oxford Street in the north, Regent Street in the west, and Piccadilly Circus in the south-west. The buildings comprise a disused brewery, which was rebuilt in 1898, occupying two island sites on the south side of the street, in close proximity to the rear of the new Lex garage in Brewer Street. The latter thoroughfare, together with Beak Street, gives access to Regent Street and Piccadilly Circus.

Entrance to both Brewer Street and Beak Street is gained from Lexington Street, which bounds the site at its western end, and is just wide enough for two lines of traffic. Ingestre Place divides the two brewery buildings, this thoroughfare also being wide enough for two vehicles abreast. The eastern building is bounded by Hopkins Street, which for some twenty yards will accommodate only a single line of traffic. It then widens sufficiently for two lines, and at the rear of a tenement building gives communication with Ingestre Place.

Both Hopkins Street and Ingestre Place have the merit of being little used, the only vehicles to be seen in them being a few trade vans, delivering at factories. Broad Street has public lavatories in the centre, and at its eastern end it merges into Berwick Street and Wardour Street, both leading to Oxford Street. Access to Oxford Street can also be gained from its western end, via Poland Street and other narrower thoroughfares.

The largest of the two breweries has an area of 14,344 square feet, the area of the smaller one being 7,400 square feet. Although both structures are being demolished with great expedition, the present plans provide for the conversion of only the smaller building into a coach station. In view of the Road Traffic Act next year, the plans for the use of the whole of the site have not yet been drawn up. It has a total frontage of 72 yards. The frontage of the eastern portion is 92 ft. 10 in., its depth being 158 ft. 5 in. The western site has a frontage of 123 ft. 2 in., its depth varying from 63 ft. 8 in. to 55 ft. 7 in. The sale of the premises and sites was effected by Messrs. Farebrother, Ellis & Co., of 29, Fleet Street, E.C.4., acting in conjunction with Messrs. Hillier, Parker, May & Rowden, of Maddox Street, W.

## COACH CONGESTION IN LONDON.

Complaints have been made during the past two years that congestion has been created in London thoroughfares by an increasing number of coaches from all over the country making use of the streets as passenger stations. In the recently-issued annual report of the London and Home Counties Traffic Advisory Committee, the Committee says: "The influx of large numbers of motor-coaches into the Metropolis is a matter which is causing some disquietude. We anticipate that the increasing employment of this type of vehicle will render it necessary at an early date to take steps to ensure that motor-coaches during their period of waiting in the Metropolis, shall be accommodated off the public highway."

When Part IV of the Road Traffic Act comes into operation on November 1 it is expected that some relief of congestion of main traffic arteries in London will be effected. Under the new Act coaches and omnibuses from the provinces will be licensed by the Traffic Commissioner, who will have power to impose conditions as to stopping places and routes.

THE INSTITUTE OF TRANSPORT.—The opening meeting of the Institute of Transport will take place on October 13 at the Institution of Electrical Engineers, London, when the Hon. Sir Arthur Stanley will deliver his address as president. The annual meeting is fixed for November 10, and will be followed by a joint meeting with the Institution of Automobile Engineers and the Commercial Motor Users' Association. The following papers will be read and discussed:—"Commercial Motor Goods Vehicles," by Mr. C. le M. Gosselin; "Passenger-carrying Vehicles," by Mr. G. J. Shave.

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# OMNIBUS AND COACH SECTION

## THE SUNBEAM OMNIBUS AND COACH.

Illustrations are given on this page of two omnibuses mounted on the "Pathan" six-cylinder two-axle chassis manufactured by the Sunbeam Motor Car Co., Ltd., of Wolverhampton. One vehicle is operated in and around Edinburgh in omnibus service by the Scottish Motor Traction Co., Ltd. It has a 32-seat saloon body, most luxuriously appointed, the coach work being by H. E. Taylor

A "Pathan" 32-seater for Uttoxeter luxury travel.

& Co., of Norwich. It is upholstered in brown furniture hide, and the exterior presents a handsome appearance in two shades of blue and white. Both vehicles have the 52-120 h.p. engine developed by the Sunbeam Company.

The machine sent to Staffordshire is operated by Messrs. Stevenson for luxury travel from Uttoxeter, and it is the firm's most striking example of their Yellow Coaches. This body is also the work of H. E. Taylor and Co., of Norwich, and it accommodates 32 passengers. The upholstery is in moquette, and the interior is decorated in maroon and cream, the external decoration being in yellow and maroon.

## SPEED OF MOTOR COACHES.

*To the Editor of* THE TRAMWAY AND RAILWAY WORLD.

SIR,—May I, through your columns, draw attention to an extremely dangerous driving practice on the part of drivers of motor coaches? Four times on Monday, between Basingstoke and Bagshot, I narrowly escaped being hurled off the road by one of these monsters. The procedure is this: Two covered-coaches are driving along, one behind the other. The driver of the first pulls out to pass a slower-moving vehicle, seeing that he has just time to do so without incommoding me—advancing in the opposite direction. The driver of the second coach, however, whose view of the road is completely blocked by the first coach and the slower moving vehicle, pulls out *immediately* and follows the first coach. The result is that by the time the first coach has regained its left-hand side of the road, the second coach and myself are due for a head-on collision. It was only frantic and furious braking on my part that averted disaster.

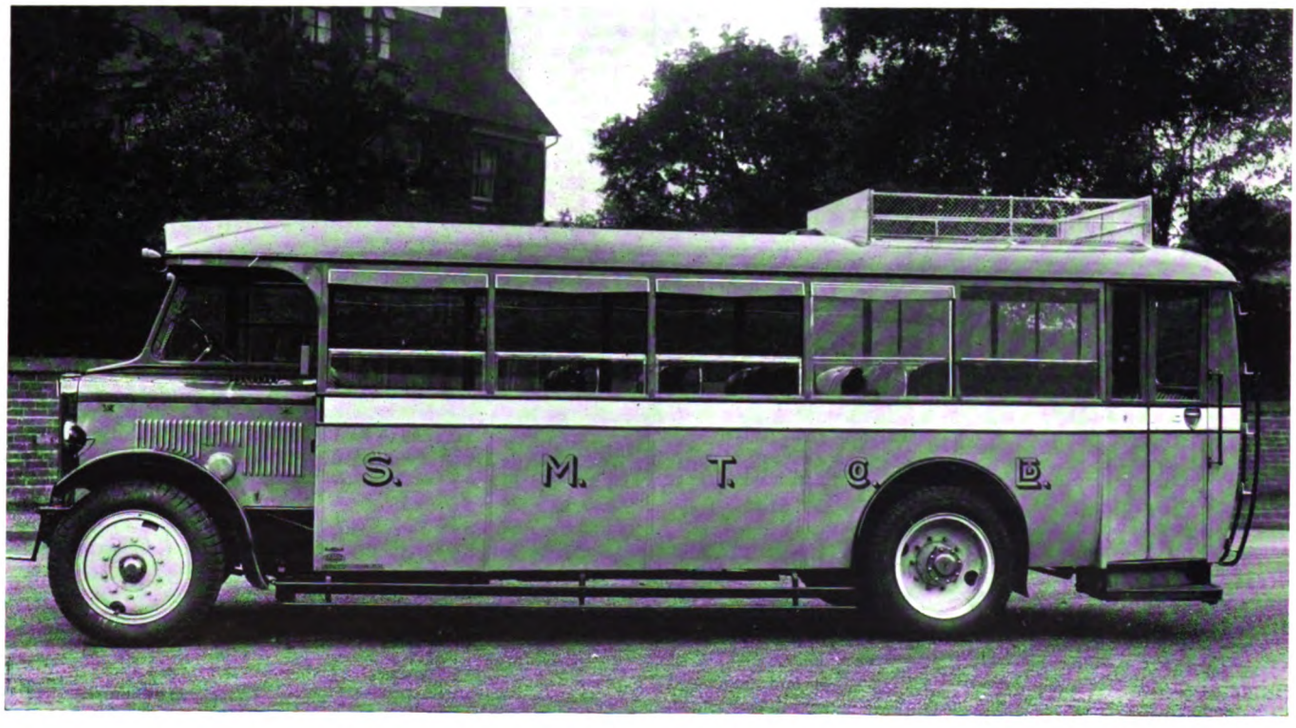
On the first occasion I did not identify the coach in any way, but the next two offenders were brown and cream vehicles proceeding to Torquay and the fourth proceeding to Bournemouth.

I am sure that the criminal folly of this practice of "following through" only needs to be pointed out to coach drivers for this danger to be averted, and I suggest that the people who should do so are the proprietors and their managers. I have always found myself that motor-coach drivers are a very good type of men, sensible and alive to their responsibilities. I am sure that only ignorance is the cause of this bad driving.

As I frequently travel this way over the week-end, it is my intention, if such bad driving occurs again, to complain to the police. I trust, however, that publicity in your columns will be sufficient to abolish this extremely dangerous practice.

May I add, finally, that I am not exactly a novice, that I have been driving since 1911!

40, Arundel Gardens, W.11. Yours very truly,
August 27, 1930. M. DIBBEN.




Six-cylinder "Pathan" 32-seater of the Sunbeam Motor Car Co. in service at Edinburgh.

PASSENGERS CUT BY GLASS.—Several passengers and the driver of a Leigh Corporation omnibus were badly cut by shattered glass in a collision with a van on September 4.

COMMERCIAL VEHICLES IN EGYPT.—At the end of June 4,846 trucks and omnibuses were registered in Egypt. New registrations during the half-year numbered 626.

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# OMNIBUS AND COACH SECTION

## THE BRITISH MOTOR INDUSTRY.

A manifesto issued on August 26 by the Society of Motor Manufacturers and Traders says that there is an increasing demand for British motor vehicles. Following are the figures of total imports and exports of all motor products for the seven months of 1930, as compared with those for the corresponding period of 1929 :—

| — | Imports | Exports | Excess of Exports |
|---|---|---|---|
| | £ | £ | £ |
| 1929 .. .. .. .. | 6,274,910 | 8,527,959 | 2,253,949 |
| 1930 .. .. .. .. | 3,946,072 | 8,696,005 | 4,749,933 |

" Both at home and in the wider markets oversea," says the manifesto, " British motor vehicles are finding an increasing proportion of the market, and it is gratifying to note that the progress made in recent years is being maintained and extended." At the same time, the industry "cannot afford to be blind to the important consequences that may follow the forthcoming Imperial Conference, and arrangements have been made for discussions to take place between representatives of the motor industry and the Dominion and Colonial Government authorities.

In a booklet entitled " British Motor Industry : Summary, 1930," the Society gives statistics of road transport in Great Britain. The output of British motor vehicles in 1929 was 238,805, of which 182,347 were private cars, and 56,458 commercial vehicles. The total number of motor vehicles exported from the United Kingdom in 1929 was 42,021, compared with 32,777 in the previous year. Particulars are also given of the exports of other producing countries. The mileage of all roads in Great Britain in 1929 was 179,095, compared with 178,918 in 1928. The number of vehicles in the United Kingdom at the September census in 1929 was 1,540,732, as against 1,332,771 in 1928. The consumption of motor spirit was 918,600,000 gallons.

## EXPORTS OF COMMERCIAL MOTORS.

The Board of Trade returns for the seven months ended July 31 show that the exports of commercial vehicles (including motor omnibuses, motor fire engines and motor ambulances, but not tractors) were in number 2,479, valued at £1,168,131, compared with 1,905 vehicles valued at £768,595 in the corresponding period of 1929 and with 717 vehicles of a value of £346,233 for the same months of 1928. The following table shows that India is mainly responsible for this expansion during the past two years :—

Exports for Seven Months ended July 31

| | 1930 | 1929 | 1928 |
|---|---|---|---|
| British India— | | | |
| Number .. .. .. | 911 | 449 | 41 |
| Amount .. .. .. | £717,069 | £396,666 | £22,830 |
| Australia— | | | |
| Number .. .. .. | 11 | 18 | 30 |
| Amount .. .. .. | £8,121 | £14,716 | £14,144 |
| New Zealand— | | | |
| Number .. .. .. | 17 | 16 | 16 |
| Amount .. .. .. | £7,691 | £5,297 | £9,316 |
| Other countries— | | | |
| Number .. .. .. | 1,540 | 1,422 | 630 |
| Amount .. .. .. | £435,250 | £351,916 | £299,943 |
| Total number .. .. .. | 2,479 | 1,905 | 717 |
| Total amount .. .. .. | £1,168,131 | £768,595 | £316,233 |

### U.S.A. Advance in India.

In a recent article recounting in the *Daily Express* his experiences in India, Mr. C. J. Ketchum said that thousands of American cars ply the streets. For every British passenger car there are ten American, and for every British lorry nearly one hundred are imported from the U.S.A. In December, 1928, General Motors opened assembling shops on the outskirts of Bombay, with Mr. G. C. Sears as the enterprising (British) managing director. In the first ten months more than 12,000 cars and trucks were assembled for distribution to all parts of India, Burma, and Ceylon.

### One Million Drop in U.S.A. Exports.

Figures published by the U.S.A. Department of Commerce indicate that up to July 31 this year 2,481,911 cars were produced in the United States, compared with 3,726,283 in the same period last year.

## SOME RECENT ORDERS.

Grimsby Corporation has purchased a Daimler 25 H.P. chassis for use with an ambulance body.

Cheltenham Corporation has purchased two dust-collecting vehicles from Shelvoke & Drewry.

The Equipment & Engineering Co., Ltd., are supplying Leeds Corporation with a garage sweeper and sprinkler.

Leigh Corporation has placed an order for power petrolling plant with the Equipment & Engineering Co., Ltd.

Aberdeen Tramways Committee has recommended the purchase of 14 Crossley double-deck omnibuses at a cost of £23,240.

East Surrey Traction Co., Ltd., have placed an order for power petrolling plant with the Equipment & Engineering Co., Ltd.

Chas. Wooler & Co., Alperton, have placed an order for a B.15 Luchard low-pressure air compressor with the Equipment & Engineering Co., Ltd.

Ransomes, Sims & Jefferies, Ltd., Ipswich, have received an order from St. Helens Corporation for five six-wheel double-deck trolleybuses complete.

Salford Corporation has placed an order for a Luchard H.8 high-pressure air compressor for tyre inflation with the Equipment & Engineering Co., Ltd.

Leyland Motors, Ltd., have an order for three " Titan " omnibus chassis for Warrington Corporation, and have supplied a tipping lorry to Salford Corporation.

Salford Electricity Committee has recommended acceptance of the tender of John I. Thornycroft & Co., Ltd., for the supply of a six-ton lorry with tipping body.

Barking Council has accepted the tender of the Avon India Rubber Co. for the provision of six fire engine tyres, and that of Shelvoke & Drewry for a dust-collecting van.

Chesterfield Transport Department has renewed for another year the contract under which tyres are supplied on a mileage basis by the Goodyear Tyre & Rubber Co., Ltd., Wolverhampton.

Wigan Council has accepted the tender of Leyland Motors, Ltd., for ten double-deck omnibuses and twenty chassis at a total cost of £35,480. Orders for additional vehicles are being considered.

Gloucester Corporation has placed a second repeat order with the Vulcan Motor & Engineering Co. for three " Duchess " 26-seat omnibuses. The first order from Gloucester was for nine " Duchess " 26-seat omnibuses ; this was followed by a repeat order in November, 1929, for three similar omnibuses.

The Vulcan Motor & Engineering Co., Ltd., have received an order from Glasgow Corporation for 25 " Emperor " 50-seat double-deck chassis. The chassis includes the Vulcan " Monarch " engine. Among other corporations that have ordered the " Emperor " chasis are Liverpool, Southampton and Southport.

Liverpool Highways Committee has accepted the tender of Shelvoke & Drewry, Ltd., for the supply of six motor lorries at £591 each ; the Yorkshire Patent Steam Wagon Co., Ltd., for the supply of a steam gulley emptier at £1,329 ; and Shelvoke & Drewry, Ltd., for the supply of a motor refuse van with special body at £595.

Ransomes, Sims & Jefferies, Ltd., have supplied to the East Surrey Traction Co. a number of double-deck bodies for A.E.C. " Regent " chassis. Several bodies have also been made for the same chassis to be operated by West Bridgford Urban Council. These bodies are similar to those of the ST type omnibuses operated by the London General Co., and they have an interior staircase.

John I. Thornycroft & Co., Ltd., have received the following orders :—Six 2-ton lorries for West Ham Corporation ; fifty-three lorries for the Indian Government and forty-three for the L.N.E.R. ; and other lorries for the Cement Marketing Co., London, A. Hollings & Co., Watney, Combe, Reid & Co., and Waygood Otis, Ltd. ; passenger vehicles for the Midland General Omnibus Co., Wolverhampton Motor Services, and the Irish Omnibus Co.

The Associated Equipment Co., Ltd., have received the following orders :—Three " Regent " double-deck chassis, Southampton Corporation, and one each from Borough Motor Services, Ltd., Empire Bus Co., and Pro Bono Publico, Ltd. ; fifty " Regal " single-deck chassis, London General Omnibus Co., twelve from the Western Welsh Omnibus Co., six from Bath Tramways Co., three from Smith's Safety Services, and one each from Folkestone Harbour Garages, Bevan & Barker, Bush & Twiddy, Sykes Motor Services, L. Baddeley and Bury Corporation ; " Reliance " single-decker, A. McKerchar. Montreal Tramways Co. has ordered two " Ranger " single-deck chassis.

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# OMNIBUS AND COACH SECTION

## OMNIBUS AND COACH SERVICES.

### MUNICIPAL.

A LANCASHIRE SUBSTITUTION.—Accrington Corporation and the Lancashire County Council are negotiating regarding the substitution of motor omnibuses for the tramways at Oswaldtwistle.

OMNIBUSES EQUIPPED WITH MALLETS.—Haslingden Corporation Tramways department has placed mallets in the omnibuses for use in breaking the windows, in the event of the emergency exits being obstructed.

OMNIBUSES WITH SEVENTEEN YEARS' SERVICE.—Douglas Corporation has withdrawn several motor omnibuses that have been in use seventeen years. Seven Tilling-Stevens vehicles have been added to the fleet, which now totals forty omnibuses.

EXPERIMENTAL SERVICE AT SUNDERLAND.—An experimental omnibus service has been started by Sunderland Corporation along the Tatham Street tramways. A new single-decker is being used with a view to the public deciding whether they prefer omnibuses.

FURTHER SUBSTITUTION AT ROCHDALE.—Rochdale Transport Committee has decided to substitute omnibuses for tramcars on four more routes. The department recently purchased fourteen omnibuses from Crossley Motors, Ltd., and it is proposed to obtain six more.

TO AVERT DEAD MILEAGE.—Newcastle-on-Tyne Transport Committee is considering a proposal to spend £30,000 in the erection of a garage on a site known as the Ouseburn tip. It is stated that the outlay would be justified by the saving on dead mileage now run by the omnibuses.

GLASGOW GARAGE EXTENSION.—The Corporation garage at Eglinton Toll is being considerably enlarged. Although the extension will provide for 200 instead of 100 omnibuses, additional accommodation will be required and members of the Transport Committee have inspected sites in the west end of the city.

MORE PASSENGERS AND FEWER MILES.—In reporting a net profit of £6,440 on the Eastbourne Corporation omnibus undertaking for the past year, the general manager states that the number of passengers (14,063,225) was a record, while the number of miles run was lower by 45,815 than the previous year. The average number of passengers carried per omnibus mile was 12.02.

MUNICIPAL AGREEMENT WITH "THE RIBBLE."—Under an agreement effected between Barrow Corporation Tramways and the Ribble Motor Services, Ltd., a municipal omnibus service is to be inaugurated between Barrow and the Ulverston district. In return the company is to develop services between North Lancashire and Walney Island, which is developing into a pleasure resort.

TWO PROPOSALS AT STIRLING.—The Town Council of Stirling has adopted a motion and remitted it to the magistrates for starting an omnibus service. Judge Macintosh, the mover of the motion, said there were complaints on certain routes, and a syndicate of local people were proposing to operate omnibuses of their own, and that was why he wished the magistrates to consider the matter first.

TWELVE THOUSAND PERSONS CONVEYED TO A FETE.—Walsall Corporation Transport Department recently received an order to convey 11,000 children and 1,000 adults to a co-operative society's fete at Sutton Park, ten miles away. The department assembled fifty omnibuses, and a similar number was contributed by the Midland Red Co. The combined fleet made two journeys each way.

WIGAN'S OMNIBUS OUTLOOK.—In due course the Corporation of Wigan will seek sanction to borrow the sum of £62,700 for the purchase of omnibuses to be used in place of the tramways. It is not expected that there will be any abandonment of a tramway route until after next November. The tramway poles will be left standing for use in the event of trolleybuses being eventually selected for permanent operation.

SLACK PERIOD PROBLEM FOR EXPRESS SERVICES.—In his annual report on Liverpool Corporation Tramways, Mr. P. Priestly, the general manager, mentions that express omnibus services at higher fares than the tramcar fares have been instituted from the centre of the city to districts already served by tramways. During the rush hours these services are fairly well patronised, but at other periods passengers use the cars and pay the lower fares.

BIRKENHEAD-CROSVILLE AGREEMENT.—Advantages are accruing to the public as the result of the agreement between Birkenhead Corporation and Crosville Motor Services. A new facility is a direct Crosville service from Birkenhead ferry to Chester at a fare of 1s. 6d. single and 2s. return. Return tickets from various places to Birkenhead or Liverpool are available on either of the services for the return journey. Combined boat and omnibus fares are issued from Eastham to Liverpool.

GLASGOW LICENSING DIFFICULTIES.—At a meeting of the Glasgow magistrates on August 26 the town clerk submitted a report on the Court of Sessions proceedings, and Mr. T. M. Wilson, an agent, made a statement on behalf of the omnibus companies, Midland Services, the Scottish General Transport Co., and Lanarkshire Transport Co. The magistrates agreed that the disputed questions should be remitted to the chief constable, who would confer with representatives of the companies with a view to reaching a settlement.

INTERIM INJUNCTIONS AGAINST TWO COUNCILS.—At Liverpool Chancery Vacation Court, on August 26, on the application of Ribble Motor Services, Ltd., interim injunctions were granted against Rawtenstall Corporation and Ramsbottom Council, restraining them from running omnibuses beyond the Burnley boundary on any route between Stockport and Burnley, without fulfilling certain statutory requirements and giving the Ribble Co. an opportunity to object at a public inquiry. It was alleged that on August 1 the two authorities extended a service from the Burnley boundary to the cattle market without applying for sanction of the Ministry of Transport.

NEWCASTLE-ON-TYNE PROGRESS.—The recent improvement in the financial result of motor omnibus operation by Newcastle Corporation is attributed in the annual report to the elimination of wasteful competition by working arrangements reached between the Corporation and the L.N.E. Railway and large private companies. The net loss for the past year was £6,420, and there is reason to hope for a small net surplus in 1930–1931. The department works thirteen routes, five in the city and eight to outside districts. A total of £19,783 was spent on new omnibuses in 1929-30, and since the issue of the report the Corporation has sanctioned an additional outlay of £50,000 upon fleet augmentation. A recent delivery is sixteen Daimler double-deck omnibuses with all-enclosed bodies built by the Brush Electrical Engineering Co.

BELFAST OMNIBUS FARES INQUIRY.—An inquiry has been held by the Northern Ireland Road Transport and Fares Tribunal into the application of the Belfast Corporation for authority to alter the omnibus fares. Mr. W. Chamberlain, general manager of the tramways, presenting the case for the Corporation, asked for a new scale involving 1d. increase in the maximum single fare on five routes and ½d. on another, and the abolition of return tickets on all routes. The omnibuses had been operating for 18 months, and on the year's working there had been a loss of £20,714. Answering the Chairman (Sir Lynden Macassey), Mr. Chamberlain said the maximum tramway fare was 2d. and the maximum omnibus fare of 3d. applied from the city centre to the tramway terminus. The justification for the increase was the higher cost of the service and its greater expedition. The Tribunal found that the Corporation had made out its case for the abolition of return tickets, but had not established a case for increasing the ordinary fare on any of the routes.

### COMPANY.

CHESTERFIELD TO BUXTON.—Baker Bros., of Warsop, have been granted a licence by Chesterfield Council to ply for hire in that town on a service to Buxton.

RESTRICTION ON DRIVERS' HOURS.—Following a conference with objecting owners, Blyth Council has decided to attach a condition to all licences restricting the hours of omnibus drivers.

CENTRAL STATION FOR BELFAST.—It is understood that the L.M.S. Railway Co. has purchased premises adjoining Smithfield Market, in the centre of Belfast, for the purpose of building a covered omnibus station.

A NORTHALLERTON MERGER.—It is stated that the business of the Northallerton Omnibus Co. has been acquired by the United Automobile Services, and that Ripon will become the headquarters of the South Yorkshire area.

APPEAL AGAINST A MINIMUM FARE.—The Minister of Transport has dismissed the appeal of Barton Transport, Ltd., against the condition that in their Birmingham-Nottingham service, the minimum fare should be 2s. 6d.

PRIVATE STANCES NECESSARY AT FALKIRK.—Following the decision of Falkirk magistrates that omnibus owners plying for hire must procure private stances, a commodious station is to be erected by W. Alexander & Sons.

CUMBERLAND ABSORPTIONS.—The public passenger services of the Ratcliffe Omnibus Co. have been taken over by Cumberland

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# OMNIBUS AND COACH SECTION

Motor Services, Ltd. The latter company has also purchased the business of Telford Bros. of Frizington.

AN UNPROFITABLE SERVICE.—The omnibus proprietors operating the service between North Shields and Newcastle via the coast road, have informed Tynemouth Watch Committee that it is being operated at a heavy loss. With a view to reducing the loss, it is proposed to alter the service to a forty-minute one.

NEW OMNIBUSES ON TILLING SERVICE.—About twenty new double-deck omnibuses are now operating on the Tilling service No. 36 between West Kilburn and Hither Green. They have sprung upholstered seats and other improvements. Three or four per week are being added to replace the older vehicles.

UTOPIA FOR MOTOR VEHICLES.—Passenger receipts of the Portuguese Railways in 1929 showed a small decrease. This result is attributed in the annual report to the economic conditions existing in that year and to the competition of motor vehicles, which occupy a privileged position in that they escape taxation and are free from control.

OMNIBUS GARAGE AT TORQUAY.—Torquay Plans Committee has approved the plans submitted by the Devon Omnibus and Touring Company, Ltd., for the erection of a garage and workshops in Newton Road, subject to (*a*) a circular area for cars being provided in front of the building, (*b*) a separate entrance and exit for vehicles, and (*c*) details of steel structural work being satisfactory.

A WELSH FUSION.—Now that the road passenger interests of the Great Western Railway in the district have been amalgamated with those of the Wrexham and District Motor Transport Co. and the Coris Railway Co., the second mentioned company has taken over the working of the G.W.R. omnibus services in North and mid-Wales and the border counties of Cheshire and Shropshire. New depots are to be opened at Wrexham and Oswestry.

AUTUMN FARE REDUCTIONS.—In consequence of a poor season at Blackpool the Coach Owners' Association at the end of August reduced their fares by 12 to 40 per cent. Following the August bank holiday week, owners in London and elsewhere have resorted to reduced fares for trips from Monday to Friday inclusive. Another venture is five days' of travel for 25s. The London passenger has a choice of five seaside resorts out of a list of fifteen towns.

PROPOSED WARSOP-NOTTINGHAM OMNIBUS SERVICE.—A Ministry of Transport Inquiry was held at Nottingham on August 26 regarding an application by Messrs. Baker Bros., of Warsop, to run omnibuses between Warsop and Nottingham via Mansfield. The Nottingham Watch Committee had refused to grant a licence on the ground that the route from Nottingham to Mansfield was already adequately served. The decision of the Ministry will be announced later.

NEW L.G.O.C. SERVICES.—Bromley Rural Council has agreed to the extension of the London General Omnibus Co.'s No. 1 service from Orpington to Green Street Green, subject to the adoption of one-way traffic along certain roads and the removal of certain obstructions. The company has applied for approval of a route for a new Sunday service from Shoreditch via West Hill, Wandsworth to Hampton Court. Another new service is from Edmonton to Kenley, via the Croydon aerodrome.

NEATH AND DISTRICT OWNERS.—The following companies have formed the Neath and District Omnibus Owners' Association :—Abbey, Bluebird, Richmond, Osborne, Willmore, Windsor, All Blue, Johns Bros., and Neath and Cardiff Luxury Coaches. They operate approximately one hundred vehicles, the routes ranging from Cardiff to Llanelly. Inter-changeable return tickets are issued on each route. Mr. V. E. Jones, managing director of Blue Bird Services, Ltd., of Neath, is hon. sec. to the organisation.

THE MODERN PILGRIMAGE TO CANTERBURY.—A little-known run by coach from London takes place on Wednesdays by East Kent Road Car from the coach station, Lupus Street, to Canterbury. The return fare of 16s. includes luncheon at a Canterbury restaurant and a conducted tour on foot. By the distribution on the Boulogne-Folkestone boat of a handbill in French, the company has this summer conveyed hundreds of French visitors from Folkestone to Canterbury, providing them with luncheon and taking them back to Folkestone by 6.30 p.m.

LANARKSHIRE TRACTION COMPANY.—By the end of September the Lanarkshire Traction Co. will have abandoned the greater part of its tramways. The motor omnibus fleet is, under the direction of Mr. E. H. Glennie, the general manager, being augmented by fifty single-deck vehicles supplied by the Daimler Co., Ltd., the bodies being by the Hoyal Body Corporation, Ltd. An agreement has been made with the local authorities whereby the company is relieved of their responsibility to restore the roadways on payment of £12,500 and handing over the track, equipment, setts and cables.

### LONG-DISTANCE.

FROM WALES TO LONDON.—A new service from Blackwood (Mon.) to Birmingham and London is being run by Red and White Services, Ltd.

LONDON-BIRMINGHAM PROJECT.—Yorkshire Traction Co. has been granted licences to ply for hire in Ossett in connection with a London-Birmingham service.

OMNIBUS-TRAMWAY CENTRE.—Plymouth Watch Committee is to report as to the practicability of establishing a tramway centre for omnibuses and coaches entering or leaving the city.

A LIMIT TO COMPETITION AT GUILDFORD.—Applications by the Premier Omnibus Co. and the Ledbury Transport Co. for licences to ply for hire in Guildford in connection with a service to and from London have been refused by Guildford Watch Committee. There are already a number of services on this route.

MERSEYSIDE TOURING COMPANY.—Southport is now included in the Liverpool-London service of the Merseyside Touring Co., Ltd., of Liverpool. The London terminus is at the London Coastal Coaches Station near Vauxhall Bridge. Connections are there made with services throughout a great area of southern England.

NORTH SCOTLAND SERVICES.—The Scottish General (Northern) Omnibus Co., Ltd., Pinefield, Elgin, has taken over control of the North Scottish omnibus services of the L.N.E.R., with which the company is associated. The services affected are those on the Deeside, Strathdon, Inverurie, Huntly, Aberchirder and Banff routes.

LONG-DISTANCE SERVICES AND CONGESTION.—Harrogate Licensing Committee has refused an application regarding a suggested coach service between Middlesbrough and Liverpool and Scarborough and Liverpool. Councillor Kidson said the Spa area was becoming congested, owing to long-distance coaches stopping to pick up and set down passengers.

READING-LONDON APPLICATIONS.—On the grounds of traffic congestion and the adequacy of existing facilities, Reading Licensing Committee has refused applications for London-Reading services by the Premier Omnibus Co. and the Skylark Coach Co. Six licences have been granted until September 30 to the Ledbury Transport Co. for a London-Reading service.

INCREASED "UNITED" SERVICES.—Following their association with the railway companies, the United Automobile Services and the Scottish Motor Traction Co. have increased their services between Scotland and the north of England. The Newcastle-Edinburgh service by way of Berwick is now an hourly one, while on the Jedburgh route coaches run four times daily each way.

NEW SERVICES TO BLACKPOOL.—The Corporation of Blackpool has granted licences for the following new services :—Ribble Motor Services, limited stop joint services from Lancaster and Middlesbrough, and from Preston, Newcastle and Carlisle. The applications of Westwood & Smith, Ltd., Edinburgh, relating to seventeen coaches, and Triumph Motor Services, Darlington, have also been approved.

FROM THE NORTH TO LONDON AND SOUTHAMPTON.—Warrington Watch Committee has granted licences for the following services :—Newcastle, Manchester and Liverpool, limited stop service jointly operated by the Northern General, North-Western Road Car, West Yorkshire Road Car, and Yorkshire (W.D.) Motor Services ; a Southampton-Liverpool service by Tourist Motor Coaches, of Southampton ; and a Liverpool-London night service by J. Pearson & Sons, of Liverpool.

LONDON'S NEW EXPRESS SERVICES.—L.G.O.C. express services in operation from and to Charing Cross, are as follow :—Maidenhead, Colnwood and Slough (every 30 minutes) ; Windsor, Colnwood and Slough (every 15 minutes) ; Windsor, Egham and Staines (every 30 minutes) ; and Sunningdale, Egham and Staines (every 30 minutes). Green Line services from and to Charing Cross are as appended :—Watford, Stanmore and Bushey (every 30 minutes) ; Watford, Mill Hill and Bushey (every 30 minutes) ; Guildford, Cobham and Esher (every 30 minutes) ; Brentwood and Romford (every 20 minutes). There are numerous ticket offices in London and in the London and country districts ; tickets are also obtainable on the coaches. Quarterly, monthly and weekly tickets are issued, and on the London-Watford service via Golders Green they are available at any Underground Railway station in the central area, as shown on the ticket. East Surrey Traction Co. and the Autocar Co., two associated companies of the L.G.O.C., maintain frequent services to London from Surrey and Kent.

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# OMNIBUS AND COACH SECTION

## MOTOR TRAFFIC NOTES.

A New Diesel Engine.—W. H. Dorman & Co., Ltd., of Stafford, have brought out a new high-speed Diesel engine. In their annual report the directors anticipate that it will meet with considerable success.

Preparing for the Motor Traffic Act.—The Watch Committee of Stoke-on-Trent Corporation has authorised the chief constable to purchase at a cost of £91 each, two additional motor cycles and sidecars.

Closing of a Branch Railway.—The passenger train service on the Skipton and Grassington branch line of the L.M.S. Railway is announced to be closed on September 22. Of late years the traffic has been taken by motor omnibuses.

Bolton Omnibus Station Proposal.—Before coming to a decision on a scheme for building an omnibus station near Moor Lane, Bolton Corporation is obtaining information from other towns as to the charges made for such accommodation.

Great West Road Extension.—Middlesex County Council and the Ministry of Transport are considering a proposal for extending the Great West Road to the London county boundary, a distance of one and a-half miles. The road carries a great industrial and passenger traffic.

A Safety Roof.—Mr. C. H. Nicholls, of the Safety Roof Co., 208, Birmingham Road, West Bromwich, has patented a roof device for ensuring the safety of passengers in an overturned motor vehicle. It is in the form of a panel which automatically becomes detached from the roof if the vehicle turns over.

Road Subsidence and a By-Pass.—Northwich Council propose to construct a by-pass road in order to divert heavy traffic from the town. As it is the centre of the brine-pumping area, Northwich is put to heavy expense by road subsidence, and it is hoped that the diversion of heavy traffic may lessen the trouble.

Manchester Garage Proposal.—Manchester Cleansing Committee has asked the city architect to prepare specifications and obtain tenders for the erection of a new garage at the Water Street depot, and for the extension of garage accommodation and provision of petrol pumps at Claremont Road depot, Rusholme.

A Synthetic Substitute for Glass.—According to the *Motor*, Dr. Péchin, a French scientist, has invented a synthetic, flexible substance with a high degree of transparency and refractive qualities superior to those of glass. It is known as similex, and can be produced commercially at about the same cost as glass.

Coach Station Charges at Eastbourne.—The following charges are recommended by Eastbourne Watch Committee for the use of the central coach station:—For each vehicle setting down and taking up passengers, 6d.; for each parked coach, 1s.; for each vehicle taking up or setting down passengers, as well as parking, 1s. 6d.

Mileage Allowance to Officials.—The Finance Committee of Notts County Council has adopted a recommendation from the Education Committee that officers in the county service who use their cars for the purpose of their duties be permitted to calculate their mileage allowance as from their homes instead of from the Shire Hall.

The Road Traffic Act and Road Motor Transport.—A pamphlet dealing with the provisions of the Act affecting owners and drivers of commercial motor vehicles has been compiled by Mr. F. G. Bristow, general secretary of the Commercial Motor Users' Association, and may be obtained free on application to the Association at 50, Pall Mall, London, S.W.1.

L.M.S.R. and the Milk Traffic.—The Cheshire branch of the National Farmers' Union has accepted an invitation from the London, Midland and Scottish Railway Co. to send a deputation to Derby to discuss whether it would be possible for the company to recover the business in the carriage of milk. The greater part of the traffic is now carried by road motor vehicles.

Foreign Visitors to the A.E.C. Works.—A Roumanian delegation, headed by the President of the Roumanian House of Deputies, recently visited the works of the Associated Equipment Co., at Southall. Several hours were spent in the inspection of the various shops in which public passenger, commercial and industrial motor vehicles are made. The business of the company has increased so largely during the past twelve months that the works have had to be considerably enlarged.

Experience of a Diesel Omnibus Engine.—Barton Transport, Ltd., report that one of their single-deck omnibuses equipped with a Diesel engine recently completed 20,000 miles in the course of 1,580 hours of service. It averaged 260 miles a day, the fuel consumption of the cold-starting engine being at the rate of 20 M.P.G. The cost of fuel was 5½d. per gallon, the lubricant used being at the rate of a quart per 260 miles. The Gardner engine was made by Norris, Henty & Gardners, Ltd., Patricroft, Manchester.

Omnibus Driver's Anti-Dazzle Lamp.—As already reported the Ministry of Transport contemplate issuing regulations restricting the capacity of headlamp lighting, and mentioning lamps and devices giving a satisfactory control of dazzle. It is stated that among these lamps is one invented by Mr. A. E. Jackman, of Chiswick, a London omnibus driver, and that after a year's trial it has been approved by the police for use on any omnibus or coach licensed in London. By cutting the ground glass in two and slanting the sections the inventor has diverted the rays up and down, and the slit of naked light greatly improves the lighting effects. A further beneficial lighting effect is given by an aperture at the base of the cup holding the bulb, allowing the naked light to shine on the front wheels or on the bumper. A driver approaching sees but two softened lights. The lamp is also said to be a good anti-fog lamp.

Importance of an Annual Inspection.—Reporting upon the annual inspection of public service vehicles, Mr. W. Melling, inspector, Stoke-on-Trent Corporation, states that he examined 386 omnibuses, three motor coaches, one char-a-banc, and nine taxi-cabs. Of the above, 226 or 56 per cent. were passed without comment. Of the 173 defective machines, 91 (52 per cent.) had defects of a mechanical nature, and in some cases the proprietors were instructed to remedy such defects (brakes, etc.) without delay. The defects in the remaining 82 (48 per cent.) were confined to body and coach work. Following out last year's practice, which received approval, the inspector has again approached certain proprietors whose vehicles were becoming old and noisy, with a view to replacing them. Some of the proprietors promised replacement, whilst others stated that the matter was under consideration. Of the 399 vehicles examined, 196 were controlled by the P.E.T. Co., as against 189 last year. This number includes companies which they have acquired.

## CHANGE OF NAME OF TILLING-STEVENS MOTORS.

*To the Editor of* The Tramway and Railway World.

Sir,—May I beg the use of a short space in your valued publication to inform your readers that the name of Tilling-Stevens Motors, Ltd., has been changed to T. S. Motors, Ltd.?

In order to forestall possible criticism, I would like to be permitted to state briefly the reasons for this somewhat unusual step.

(1) To remove the lingering impression that our products are confined to the manufacture of petrol-electric vehicles.

(2) To emphasise again that the operating company bearing an almost similar name has no financial or other interest in our company, and that such support as we receive has depended, and is dependent on, the merits of the "Express" gear-driven chassis.

(3) To assure Government, railway companies and municipal bodies that when purchasing our passenger-carrying vehicles they do not support in any way their competitors, since we have no financial or other interest in any operating company or group of operating companies, nor are we ever likely to adopt such a policy.

(4) To enable the representatives of competitors to refrain from supporting tacitly or otherwise any contrary statement which may be made.

For the information of your readers who are transacting business with us, may I say finally that beyond the change of name the affairs of the company will be conducted as heretofore.—Yours faithfully,

W. R. Shephard,
Managing Director,
T. S. Motors, Ltd.
August 19, 1930. (formerly Tilling-Stevens Motors, Ltd).

## GLASGOW ORDERS 100 OMNIBUSES.

Glasgow City Corporation on August 21 sanctioned the expenditure of £163,575 on the provision of one hundred double-deck motor omnibuses for the Tramways and Omnibus Department. The contracts were placed as follow:—Leyland Motors, Ltd., Leyland, Lancs, 75 chassis at £950 each; Vulcan Motor & Engineering Co., Ltd., Southport, 25 chassis at £933 each; Cowieson & Co., Glasgow, 100 bodies at £690 each. The vehicles will have a central gangway on the upper decks.

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LONDON, SEPTEMBER 20, 1930.

## THE ROAD TRAFFIC ACT.

Omnibus and coach operators need not be alarmed at the rumours circulating with regard to the Road Traffic Act, especially in the matter of drivers' licences. For the safety of the public and for their own protection from actions for damages, the leading owners insist upon applicants for employment passing a medical examination. The new law will, to a considerable extent, protect passengers from the less careful employers, as an applicant for a licence must declare, under substantial penalties, whether he has any physical disability, and his fitness must include freedom from fits and other afflictions and a minimum eyesight standard. That standard will be determined next week at a conference of representatives of the British Medical Association and of the motor organisations. Apart from the physical fitness of the driver, the Code of the Road will assume his knowledge of road rules. This desirable guide is to be distributed with the car and driving licences on January 1. While the code is not enforceable by law, it will undoubtedly increase public safety, for failure to observe its provisions may affect questions of legal liability in an action or a prosecution. One commendable object of the code is to obtain complete standardisation of signals, which have yet to be approved by the authorities and organisations concerned. Regarding the compulsory insurance against third-party risks, this may drive out those owners who even now do not possess a road licence. It is to be hoped that "pirates" will not be granted licences in any of the twelve licensing areas that are to supplant the present 1,300 licensing authorities. This portion of the Act will not become operative until March 1 next, but the Minister will exercise his powers to make transitory provisions, mainly to bring into force the requirements of Part IV. If the hopes held out in justification of Part IV come anywhere near realisation, we are eventually to see the end of congestion created by senseless competition, the supplying of guaranteed services to areas at present neglected, the provision for all of reasonable wages and limitation of hours of work already enjoyed by the employees of the municipal and best company undertakings, and the exercise of a much-needed control of coaches running to London, as well as those in provincial service, particularly in the use of streets for setting down and taking up passengers. Some difficulty may be experienced in restricting coaches and long-distance omnibuses to the new speed of 30 m.p.h., but it is to be hoped that there will be a general acceptance of the new conditions.

## MORE OMNIBUS ROUTES FOR MANCHESTER.

CERTAIN TRAMWAYS TO BE ABANDONED.

Following a report by Mr. R. Stuart Pilcher, general manager of Manchester Corporation Transport, the Transport Committee on Tuesday decided to recommend the City Council to abandon the tramway services between Altrincham and Sale Moor and Old Trafford, and that portion of the tramway in City-road used only by the Altrincham services. The Chester-road and Stretford-road tramway routes to Old Trafford, which serve the cricket and football grounds, will be retained. A number of local authorities are concerned, but Mr. Pilcher does not anticipate any serious difficulty in getting their consent to the change. Double-deck omnibuses, seating 50 passengers, are proposed to be substituted both for express and ordinary services.

Mr. Pilcher reported that during the past few years the receipts on both the Altrincham and Sale tramway routes have shown a steady decrease, while the express omnibus receipts have steadily increased. There is also competition from unlicensed omnibuses. The increase on No. 53 circular route, which was recently converted to omnibuses, has been extraordinary, and he considers that on the three routes now to be changed, omnibuses will be equally successful. The reconstruction of the permanent way would involve an immediate expenditure of £93,865, and Mr. Pilcher had no hesitation in recommending the abandonment of the tramways and the substitution of omnibuses. A total of 39 tramcars will be displaced, but as they are of a good type they can be substituted for obsolete cars on other routes. Mr. Pilcher does not consider any increase in the intermediate fares will be necessary, but some increase in the through fare of 4d. for nearly 9½ miles, which is very low, will have to be made.

The general manager adds: "There is a constant demand for more express 'buses, but the effect on the tramways has been such that on March 31 last the service of cars had to be restricted. In order to retain the traffic as far as possible, cars have been speeded up. Notwithstanding these improvements, the public evidently prefer the 'buses, and are prepared to pay higher fares in order to travel in them. This process of reducing the tramway mileage cannot go on indefinitely, as to take off more cars and reduce the service to less than the present ten minutes would not be efficient. Duplicate cars and 'buses cannot be run on a remunerative basis."

Mr. Pilcher has stated that this must not be taken to mean a general change over on tramway routes to outlying towns. Other routes will not be similarly treated unless conditions are found to be the same as on the Altrincham route.

## LONDON TRAFFIC UNIFICATION.

Sir Wm. McLintock, the chartered accountant, is understood to have presented to the Minister of Transport his report on the financial aspects of the Government's proposal for the unification of London passenger traffic, and it is asserted that London Labour members have represented to the Prime Minister that a Bill to give effect to the scheme should be included in the King's Speech for next session. No confirmation is obtainable of a statement that Sir Wm. McLintock's report is a "favourable" one. It will be remembered that last Session the House of Commons by a majority refused to afford facilities for consideration of the Bills of the London County Council and the Underground Group for the co-ordination of London traffic. Subsequently the Minister of Transport announced the submission of a scheme to Sir Wm. McLintock for a report on its financial aspect. Mr. Morrison added that the proposal would aim at "the complete consolidation upon fair and equitable terms of the passenger transport agencies now providing services by omnibus, by tramway, or by local railways in the London traffic area."

## THE HARROGATE CONFERENCE.

INTERNATIONAL PRESIDENT AND SECRETARY TO ATTEND.

We are pleased to learn from M. A. de Backer that the annual conference of the Municipal Tramways and Transport Association, to be held at Harrogate next week, will be attended by the president of the International Union of Tramways, Light Railways and Public Automobile Transport and by himself as secretary-general. M. F. de Lancker, who is director of the Brussels tramways, has been president of the Union since 1924.

**Omnibus Fares in the Glasgow District.**—The recent amalgamations of omnibus companies operating between Glasgow and the surrounding districts is likely, it is understood, to result in increases in the fares. Return fares on the Milngavie and Bearsden route have already been increased from 10d. to 1s. In explanation of the prospective changes, it is stated that on various routes a loss has been incurred owing to the unchecked competition which prevailed some time ago. The position has, of course, been altered by recent amalgamations.

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## THE TRAFFIC COMMISSIONERS.

The Ministry of Transport has received more than a thousand applications for the twelve positions of Traffic Commissioner under the Road Transport Act, at a salary of between £1,000 and £2,000 per annum. Applications have been coming in ever since the publication of the report of the Royal Commission on Transport in which the appointment of Commissioners was recommended, and there were numerous additions when the Government's Bill was published, when it became an Act, and when the appointments were advertised. The great majority are from persons without the necessary qualifications.

The Minister of Transport will make his selections in time for the Commissioners to enter upon their duties in November next.

## RESIGNATION OF MR. R. H. WILKINSON.

General regret will be felt at the resignation of Mr. R. H. Wilkinson, general manager of the Bradford Corporation Transport system, owing to ill-health. His resignation was accepted by the Tramways Committee on Monday. Normally it would not take effect until December, but owing to the report of his doctor, who urged Mr. Wilkinson not to spend another winter in Bradford, the Committee agreed to release him as soon as practicable. Under the superannuation scheme, Mr. Wilkinson will be entitled to a pension of £400 per annum.

For some time Mr. Wilkinson's health has not been good, and last year he had to take a sea voyage. The strain of trying to put the tramways on a better financial footing, in view of the intense omnibus competition, has been very onerous. It is only a week or two since we recorded the appointment of a sub-committee to suggest means of attracting further revenue to the tramways, and it was understood that that course was taken at Mr. Wilkinson's request, he having prepared a long report on the problem. His resignation will make the task of the sub-committee more difficult. The chief feature of the report was the abolition of tramway routes where track renewals were necessary, and the substitution of trolleybuses, as authorised by the Corporation's new Act. This would involve an expenditure of about £500,000.

Mr. Wilkinson was appointed to Bradford in November, 1918, succeeding Mr. C. J. Spencer, now general manager of Metropolitan Electric and London United Tramways. Previously he was for fourteen years tramways manager and engineer at Huddersfield, was four years in a similar position at Oldham, and for two years was in the service of the Liverpool Tramways Department. Mr. Wilkinson's experiments at Bradford with vehicles of his own design led the way to the introduction of the double-deck trolleybus in this country. He has also designed other vehicles which have been described and illustrated from time to time in THE TRAMWAY AND RAILWAY WORLD. While he was at Huddersfield, Mr. Wilkinson introduced a tramcar with a rear entrance and front exit. Last year he submitted to the Institute of Transport a paper in which the merits of tramcars, trolley and petrol omnibuses were discussed. His own inclination was to the trolleybus, not only for town traffic but for inter-urban transport.

Councillor Irvine Smith and Councillor W. Hodgson, chairman and vice-chairman of the Tramways Committee, and Mr. W. Leach, M.P., were visiting London at the end of this week with the object of inducing Mr. Spencer to return to Bradford as the general manager.

## PERSONAL.

**Mr. J. P. Savage** has been appointed publicity manager to the Birmingham and Midland Omnibus Co.

**Alderman Arthur Rudd,** chairman of the St. Helens Tramways Committee, has been selected by the Labour majority to be the next Mayor of St. Helens.

**Mr. Cyril Dennis,** of W. B. Dick & Co., Ltd., has been approached to allow his name to go forward as a prospective candidate for Parliamentary honours. For business reasons he has been obliged to decline the invitation.

**Mr. J. Harcourt Williams,** manager of the Manchester branch of the British Thomson-Houston Co., Ltd., has been appointed to succeed Mr. A. L. Lunn as deputy-chief engineer of Manchester Corporation Electricity Department.

**Mr. H. Moxon,** who has been with Leeds Tramways Department for thirty years, including the past eleven years as deputy-accountant, has been recommended by the Tramways Committee for the position of chief accountant, in succession to the late Mr. J. W. Blakeborough.

**Mr. G. Martin Gamble** has been appointed by Karrier Motors, Ltd., of Huddersfield, as sales manager, and he is taking up his duties at Huddersfield at once. Mr. Gamble was associated with the company from 1910 to 1919, and inaugurated the sales department of which he is again in charge.

**Mr. H. A. Blackburn,** general manager and engineer of Keighley Corporation Transport, has been appointed manager of Great Yarmouth Corporation Transport Department. There were 82 applicants, and, as we stated last week, four candidates were selected for interview by the Transport Committee. Mr. Blackburn is a son of Mr. A. A. Blackburn, general manager and engineer of Huddersfield Corporation Transport. He has held his position at Keighley for the past eighteen months, having succeeded Mr. Ronald A. Fearnley, who was appointed engineer and general manager of Southend Corporation Transport Department.

## MISCELLANEOUS NEWS AND NOTES.

**Free Travel for Blind Persons.**—Wallasey Corporation is allowing free travel to blind persons resident on Mersey-side, in order to co-operate with Liverpool and Birkenhead.

**Chatham and District Traction Co.** are withdrawing at the end of September the tramcars on the 36 miles of track which serve Chatham, Gillingham, and Rochester. Omnibuses are being substituted.

**The B.E.A.M.A. Dinner.**—The annual dinner of the British Electrical and Allied Manufacturers' Association will be held at the Connaught Rooms, Great Queen-street, London, W.C.2, on Wednesday, November 19.

**Hove Approves Brighton Traffic Merger.**—On September 11 Hove Town Council unanimously passed the report of the General Purposes Committee approving Hove's part in the scheme of amalgamation of the omnibus services of Tillings, Ltd., and the Brighton Corporation Tramways.

**Oldham Strike Averted.**—At Oldham, where the Tramways Committee proposed to dismiss 25 men in the omnibus and tramways maintenance department for economy, a threatened strike was averted when an offer to work short time was accepted, and the dismissals avoided.

**Kingsway Subway Enlargement.**—It is expected that the enlarged subway between Waterloo Bridge and Southampton-row, via the Kingsway, will be ready for reopening before Christmas. The alteration will enable double-deck cars to run through from the Victoria Embankment to North London.

**Proposed Omnibus Stations in Glasgow.**—It is understood that the combined omnibus companies operating in Glasgow are considering the erection of four large stations in the city at an estimated cost of £150,000. They desire the assurance of the magistrates that these stations would be recognised as stances.

**A Proposed Aberdeen Substitution.**—In consequence of the loss on the Ferryhill tramway service, and the need for renewal of the track, Aberdeen Tramways Committee recommend that petrol omnibuses should be substituted. The Council recently decided to discontinue the tramcar service on another route.

**Popular Edinburgh Cars.**—Councillor Adam Miller, convener of Edinburgh Transport Committee, recently said that their latest cars with enclosed tops and comfortable upholstery were proving very popular with the public. These cars, which run very smoothly, are equipped with the Peckham pendulum truck.

**New Cars for Sheffield.**—The Corporation Tramways and Motors Committee has decided that twenty tramcars shall be constructed in the department's workshops this financial year. Last year 36 cars were completed and placed in service, 19 of these being constructed by the department, and 17 supplied by contractors.

**Ticket Issuing in Queues.**—Between 7.30 a.m. and 9.30 a.m. omnibus passengers in the queues at London Bridge Station receive tickets from two conductors using the Hall ticket-printing machine. As most of the passengers ride only over the bridge to the City, it has been found difficult to collect all the fares on the omnibuses.

**Tees-side Railless Traction Board.**—A conference of representatives of Middlesbrough Corporation, Eston Council, and the Tees-side Railless Traction Board, has decided that the board should deal with the rolling stock as it deems expedient until the whole question of mechanical transport in the area has been investigated.

**Traction Meters for Cars.**—At Oldham Corporation Tramways Committee, the general manager reported further on the question of fitting traction current meters to tramcars, and gave particulars of consumption on a few cars to which meters had been fitted. It was decided that meters be fitted on all cars when brought in for periodical overhaul.

**Leeds' New Tramcars.**—The electrical equipment for fifty of the hundred new tramcars now on order for Leeds Corporation Tramways has been ordered from the General Electric Co., Ltd. Each set comprises two standard traction motors of 50 h.p. each, 500 volts two-drum type controllers arranged for rheostatic braking, circuit breakers, current collecting gear, and resistances.

**An Offer of Traffic Signals.**—At the Magistrates' Committee of Glasgow Corporation, there was submitted a letter from the Forest City Electric Co., Ltd., offering to supply on trial, free of cost, a complete set of traffic signals on any suitable site. The Committee, after consideration of reports by the chief constable and city engineer, agreed to recommend that the proposal be not entertained.

**L.G.O.C. in a Coach "War."**—Twenty independent coach owners in London, who claim to have 400 coaches, have combined against the express services of the Green Line of the L.G.O.C. The independents have introduced new coaches, with cuts in fares, on the London-Maidenhead, London-Windsor, and London-Brentwood services. Mr. C. Dobbs, managing director of the Skylark Company, has taken charge of the rival organisation, and in an interview with a London newspaper he has confirmed the foregoing statements.

**Driving Licences under the New Act.**—The Royal Automobile Club, the Automobile Association, and other organisations have under consideration the suggested form of declaration of physical fitness, or otherwise, by drivers under the Traffic Act. January 1, 1931, is mentioned as the date when the new form of licence will come into operation. A conference of all associations and authorities interested in road traffic will be held on September 23 to discuss the regulations which the Minister must make under the Act. Later on there will be a conference on the Highway Code, which the Minister hopes to lay before the House of Commons in October.

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**Birkenhead Corporation Omnibus Fleet.**—In the annual report of Mr. Cyril Clarke, general manager, Birkenhead Corporation Tramways and Motors, it is shown that the Corporation owns 105 motor omnibuses, which ran 2,649,645 miles last year. The average number in daily use was 74, compared with 61, the average fare paid per passenger was 1.955d., and the cost per passenger 1.259d.

**The Manufacture of Omnibus Bodies.**—The Transport Committee of Glasgow Corporation has asked the town clerk to report on a proposal to incorporate a company to manufacture motor omnibus bodies. It will be remembered that Parliament last session deleted from the Corporation Bill a clause under which the Transport Department would be authorised to build omnibus bodies in the tramcar workshop.

**Scope of the Bradford Inquiry.**—At the request of the sub-committee appointed on the suggestion of the general manager to investigate the position of Bradford tramway undertaking and to make recommendations for arresting the decrease in revenue, the Tramways Committee has enlarged the terms of reference. The sub-committee has now authority to submit recommendations for reorganising the whole department.

**Demand for 100 Per Cent. Excess Fare.**—Oldham Corporation has agreed to extension of the omnibus service of Mr. T. H. Parker on the Oldham-Blackpool route on the condition that the intermediate fares are 100 per cent. in excess of those charged on the tramway and omnibus services of the Corporation. For some time it has been a cause of complaint by municipal authorities that the present excess charge of 50 per cent. is no protection.

**Melbourne Tramways.**—The Victorian Legislative Assembly are considering a Transport Bill which makes provision for the abolition of the Melbourne and Metropolitan Tramways Board. The Bill provides also for placing the tramways under the control of the Commissioner of Tramways, whose term of office will be five years. It is expressly provided that the Commissioner shall not purchase material from outside Victoria without the sanction of the Ministry of Transport.

**A Sheffield Reform.**—The sum of £9,490 contributed by Sheffield Tramway and Motors Department towards street improvements during the past financial year is the final payment which the Committee will make on that account. The City Council has decided that improvements made for the benefit of all transport facilities should not be a special charge against the department. The total amount paid out of tramway revenue towards street improvements has been £202,474.

**Injured by Flying Glass.**—A collision between a tramcar and an omnibus at Birmingham resulted in a woman being injured in the leg by a piece of glass; other passengers were considerably frightened by flying glass. At Newcastle an omnibus collided with a lorry, and one of the passengers said the first he knew was being struck on the neck by a large piece of framework and pane of glass. At Tooting, when three cars were involved in a crash, a child received cuts on the face.

**Pontypridd's Need of a Spare Omnibus.**—The Pontypridd Urban Council have four omnibuses in service, and Mr. J. E. Teasdel, general manager and engineer, has pointed out that they could not be expected to run for ever without repairs. He suggested the purchase of a new omnibus to substitute for the others when under repair. The Tramways Committee has decided, however, to call for a report on the comparative cost of purchasing a new vehicle and having repairs done to the others at night.

**A Sunderland Experiment.**—During the 26 days of August on which tramcars were used on the Villette-road route, Sunderland, there were 201,396 passengers, a daily average of 7,746. On August 27 motor omnibuses took over the service, and during the remaining five days of the month, 43,043 passengers were carried —a daily average of 8,609, or 863 more per day than on the tramcars. Receipts increased by more than £3 a day, a figure which, if maintained, will mean an increase of nearly £1,100 per annum.

**London Omnibus Traffic Decrease.**—The London General Omnibus Co., on September 13, issued the following statement: "During August, when the seasonal decline in traffic occurs, it has been customary to withdraw a number of 'buses from service according to traffic requirements. This year it has not yet been found possible to reinstate these 'buses. The company much regret that as a result of this it has become necessary to reduce the traffic staff, both drivers and conductors. As soon as circumstances permit, and it is again found possible to take on men, those concerned in these dismissals will have preference over all others." There are between 50 and 60 routes affected, and the number of omnibuses withdrawn is 194, involving 250 men.

**International Tramways Congress.**—In a report to the Manchester Corporation Transport Committee by Coun. I. Brassington (chairman), Coun. T. H. Adams, and Mr. Stuart Pilcher (general manager), on their visit to the International Tramways Congress held at Warsaw, it was stated that one of the most interesting papers presented dealt with the development of the Diesel engine for road transport. In comparison with the petrol engine, the Diesel unit had an economy of fuel of 20 to 25 per cent. British delegates who visited the tramway workshops in Warsaw were impressed by their efficiency as compared with other Continental workshops. Visits were paid to Cracow, Posen, Berlin, Hamburg, and Amsterdam. The outstanding impression given by the transport systems in those cities was that the omnibuses were not so advanced as the tramways. That might be due partly to the fact that the roads were not so good as those in Great Britain. Compared with Britain, the omnibuses were years behind in development. The vehicles ran on solid tyres and were rather noisy.

**Diesel Engine Omnibus for Leeds.**—L. Gardner & Sons, Ltd., Patricroft, Manchester, have completed a 48-seat double-deck omnibus fitted with their high-speed Diesel engine, which has been put into service this week by the Leeds Corporation. It is claimed that 200 miles can be run by a fully-loaded 32-seat Diesel-engine vehicle on ten gallons of heavy fuel oil, and at 4¾d. a gallon, the total cost would be 3s. 11½d. The omnibus was given an experimental run on September 8 over the Beeston heights, with a result entirely satisfactory to the officials of the Tramways Department and the members of the Tramways Committee. It was then driven back to Manchester for minor adjustments before being placed in service.

## FINANCIAL.

**The National Electric Construction Co., Ltd.,** have declared an interim dividend of 5 per cent., less tax.

**The British Aluminium Co., Ltd.**—An interim dividend has been declared of 4 per cent. on the ordinary shares, less tax.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended September 17 amounted to £81,858, a decrease of £1,306 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to September 17 (24 2-7 weeks), the total receipts were £2,004,031, a decrease of £16,331.

**Derby Corporation Tramways and Omnibuses** for the year ended March 31 had traffic receipts totalling £174,195, against £160,051 in the previous year. Passengers totalled 29,702,629, against 27,527,642. Tramway receipts were £2,557 less at £132,722; omnibuses £41,472, or £16,665 more. Gross profit on tramways was £23,986, and net profit £1,182; and for the omnibuses £4,985 and £352 respectively. Receipts on the tramways per car mile were 17.763d., against 17.691d.

**Birkenhead Corporation Tramways and Motors** made a net profit for the year ended March 31 of £31,845, a decrease of £534. The tramways accounted for £6,845 and the omnibuses £25,000. The tramways revenue was £88,706, compared with £98,764, and that of the omnibuses £183,017, compared with £150,446. In the omnibus section larger amounts were paid for interest, sinking fund and income tax—£41,389, compared with £28,692—and of the net profit £14,000 was voted to rate relief and £11,000 was transferred to the tramways net revenue account. Nearly 39 million passengers were carried, an increase of 3½ millions.

## CONTRACTS.

**Dennis Bros., Ltd.,** have received a repeat order for fourteen "Dart" 20-seat omnibuses from the London General Omnibus Co.

**Exeter Tramways Committee** has accepted a tender for the supply of six double-deck motor omnibuses of the straight staircase type, at £1,640 each.

**Siemens Electric Lamps and Supplies, Ltd.,** have a contract from the G.P.O. for a twelve months' supply of Siemens gas-filled, vacuum and special lamps.

**Leigh (Lancs) Motor Omnibus Committee** has placed an order for three Crossley 32-seat omnibuses, and three Leyland omnibuses, at a total cost of £7,350.

**Islington Cleansing Committee** recommends the tender, at £105 7s. 9d., of the Edison Swan Electric Co., Ltd., for the supply of a battery for an Orwell electric vehicle.

**J. W. Courtenay, Ltd.,** of Amberley House, Norfolk-street, London, W.C.2, have been appointed by Newport (Mon) Corporation sole advertising contractors for their motor omnibuses.

**Crossley Motors, Ltd.,** have a second repeat order from Rochdale Corporation for single and double-deck omnibuses. This follows a recent order for fourteen machines and makes a total of 20 Crossley omnibuses for Rochdale Corporation.

**Glasgow Transport Committee** has recommended acceptance of the following tenders:—Vulcan Motor and Engineering Co., Ltd., and Leyland Motors, Ltd., for the supply of air brakes for motor omnibuses; G. & J. Weir, Ltd., and Mirrlees, Watson & Co. for boiler feed pumps.

**Lamplugh Spring Seats, Ltd.,** New Oxford House, Hart-street, W.C.1, have a further order for 25 sets of seats for tramcars from Birmingham Corporation. This makes the fifth order received from Birmingham Corporation, which now has about 400 tramcars equipped with Lamplugh seats.

**The Associated Equipment Co., Ltd.,** have recently received orders for the following vehicles:—Passenger vehicles: "Regent" double-deck, Bassett & Sons (2); "Regal" single-deck, Ayr and District Motor Services (3), T. Severn & Sons, Stockton Corporation, and Timpson & Sons (38); "Ranger" single-deck, Timpson & Sons (10); 20-seat single-deck, Timpson & Sons (12). Goods vehicles: "Mercury" 3½ ton, Anglo-American Oil Co. (2); "Monarch" 4-ton, Mutter Howey & Co., W. Curtiss & Sons, Stockport Co-operative Society; "Majestic" 6-ton, B. I. Transport Co.; "Mammoth" 7-8 ton, Pickfords, Ltd. (3), H. & G. Simmonds (2), L. W. Holdsworth, J. Hanson & Sons, Strood Engineering Co., Hall & Sons, Warpool Transport, Lashley & Sons, and F. Edlin; "Mammoth" 7-8 ton, D. & H. Cuff, S. Marshall & Sons, J. A. Meeks & Sons; 6-wheel freighter, Pickfords, Ltd.; 6-ton 1929 model, ex-Army Transport. Overseas orders: "Regal" single-deck Urania Bil, Stockholm (3); "Regal" single-deck, Lima Tramways (Metropolitan Bus Co.).

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## BUSINESS NOTES.

**Pirelli Tyres, Ltd.,** have opened a new tyre depot at 118, New Bridge-street, Newcastle-upon-Tyne.

**Traffic Areas** under the Road Traffic Act are outlined in a map published by the "Motor Transport Year Book and Directory," issued from the Electrical Press, Ltd., Fisher Street, W.C.1. Single copies are obtainable from that address at 2s., post free.

**Edgar Allen & Co.,** Imperial Steel Works, Sheffield, publish in the September issue the hundredth number of "Edgar Allen News." Letters from readers in many countries are quoted in which they testify to the utility of the magazine to their respective firms. Included in the interesting articles published in this issue is an illustrated description of the trackwork department, which covers fourteen acres, including eight acres for laying out junctions of any size. In this department the outstanding advance has been the drilling of manganese steel by means of the company's new tool steel. An article deals with the turning, boring, and planing of manganese steel.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | Latest Return. 1930 | + or — | Aggregate. Wks | Aggregate. 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | Aug. 19 | 517 | 512 | — 5 | 20 | 11,600 | — 222 |
| „ Motor Buses ... | „ 19 | 210 | 277 | + 67 | 20 | 5,870 | + 994 |
| „ Total ... ... | „ 19 | 727 | 789 | + 62 | 20 | 17,470 | + 772 |
| Aberdeen Corp. ... | Sept. 10 | 5,264 | 5,081 | — 183 | 14½ | 84,093 | + 757 |
| Ashton-u-Lyne Corp. | „ 13 | 924 | 822 | — 102 | 24 | 20,505 | — 1,603 |
| „ Motor Buses ... | „ 13 | 461 | 478 | + 17 | 24 | 12,005 | + 113 |
| „ Trolley Buses ... | „ 13 | 275 | 255 | — 20 | 24 | 6,242 | — 419 |
| „ Total ... ... | „ 13 | 1,660 | 1,555 | — 105 | 24 | 38,752 | — 1,909 |
| Ayr Corporation ... | „ 13 | 666 | 586 | — 80 | 17 | 11,783 | — 973 |
| Barrow Corporation... | „ 6 | 641 | 605 | — 36 | 23 | 13,662 | — 1,063 |
| „ Motor Buses ... | „ 6 | 475 | 453 | — 22 | 23 | 9,831 | + 752 |
| „ Total ... ... | „ 6 | 1,116 | 1,058 | — 58 | 23 | 23,493 | — 311 |
| Belfast City ... ... | „ 12 | 11,624 | 11,658 | + 34 | 23½ | 271,405 | + 8,284 |
| „ Motor Buses ... | „ 12 | 1,061 | 1,274 | + 213 | 23½ | 30,637 | + 6,386 |
| „ Total ... ... | „ 12 | 12,685 | 12,932 | + 247 | 23½ | 302,042 | + 14,670 |
| Birkenhead Corp. ... | „ 14 | 1,660 | 1,454 | — 206 | 24 | 37,212 | — 4,013 |
| „ Motor Buses ... | „ 14 | 3,541 | 4,009 | + 468 | 24 | 90,691 | — 1,489 |
| „ Total ... ... | „ 14 | 5,201 | 5,463 | + 262 | 24 | 127,903 | — 5,502 |
| Birmingham Corp. ... | „ 9 | 27,535 | 25,029 | — 2,506 | 23 | 603,438 | — 19,295 |
| „ Motor Buses ... | „ 9 | 13,560 | 15,743 | + 2,133 | 23 | 353,242 | + 57,679 |
| „ Trolley Buses ... | „ 9 | 559 | 507 | — 52 | 23 | 12,481 | — 149 |
| „ Total ... ... | „ 9 | 41,654 | 41,279 | — 371 | 23 | 969,161 | + 38,235 |
| Blackburn Corp. ... | „ 10 | 2,184 | 1,905 | — 279 | 23½ | 43,016 | — 3,733 |
| „ Motor Buses ... | „ 10 | Nil | 315 | + 315 | 23¼ | 7,479 | + 7,479 |
| „ Total ... ... | „ 10 | 2,184 | 2,220 | + 36 | 23¼ | 50,495 | + 3,746 |
| Bradford Corporation | „ 13 | 15,416 | 14,373 | —1,043 | 24 | 340,250 | — 15,255 |
| Brighton Corporation | „ 14 | 3,151 | 2,958 | — 193 | 23¾ | 70,771 | + 1,994 |
| Burnley Corporation... | „ 13 | 3,181 | 2,806 | — 375 | — | ... | — |
| „ Motor Buses ... | „ 13 | 684 | 671 | — 13 | — | — | — |
| „ Total ... ... | „ 13 | 3,865 | 3,477 | — 388 | ... | .. | — |
| Burton-on-Trent Corp. | „ 14 | 783 | 858 | + 75 | 24 | 20,294 | + 707 |
| Bury Corporation ... | „ 14 | 2,002 | 1,623 | — 379 | 23½ | 43,336 | — 5,614 |
| „ Motor Buses ... | „ 14 | 624 | 1,389 | + 765 | 23½ | 27,040 | + 16,290 |
| „ Total ... ... | „ 14 | 2,626 | 3,012 | + 386 | 23½ | 70,376 | + 10,676 |
| Cardiff Corporation ... | „ 13 | 7,944 | 7,732 | — 212 | 23½ | 186,549 | + 1,532 |
| Chatham and District | „ 11 | 1,419 | 1,280 | — 139 | 36 | 42,277 | + 423 |
| Chester Corporation ... | „ 7 | 444 | Nil | — 444 | 23 | Nil | — 10,313 |
| „ Motor Buses ... | „ 7 | Nil | 693 | + 693 | 23 | 15,385 | + 15,385 |
| „ Total ... ... | „ 7 | 444 | 693 | + 249 | 23 | 15,385 | + 5,072 |
| Chesterfield Corp. ... | „ 15 | 1,983 | 1,941 | — 42 | 24 | 46,039 | + 1,035 |
| Colchester Corp. ... | „ 17 | 583 | 622 | + 39 | 25 | 15,405 | + 1,638 |
| Colne Corporation ... | „ 17 | 700 | 661 | — 39 | 24 | 17,329 | — 372 |
| Coventry Corporation | „ 14 | 2,008 | 1,830 | — 38 | 24 | 47,604 | — 3,421 |
| „ Motor Buses ... | „ 14 | 1,625 | 1,857 | + 232 | 24 | 43,039 | + 5,331 |
| „ Total ... ... | „ 14 | 3,693 | 3,487 | — 06 | 24 | 90,643 | + 1,910 |
| Darlington Corp ... | „ 13 | 990 | 1,069 | + 279 | 23½ | 25,326 | + 2,141 |
| Derby Corporation ... | „ 13 | 2,614 | 2,382 | — 132 | 24 | 58,600 | — 1,828 |
| „ Motor Buses ... | „ 13 | 790 | 918 | + 128 | 24 | 21,896 | + 4,736 |
| „ Total ... ... | „ 13 | 3,404 | 3,300 | — 04 | 24 | 80,466 | + 2,908 |
| Dover Corporation ... | „ 13 | 504 | 492 | — 112 | 24 | 10,878 | + 334 |
| Dundee Corporation... | „ 2 | 2,797 | 2,658 | — 339 | 15½ | 40,506 | — 1,257 |
| „ Motor Buses ... | „ 2 | 956 | 1,346 | + 290 | 15½ | 17,616 | + 4,371 |
| „ Total ... ... | „ 2 | 3,753 | 4,004 | + 51 | 15½ | 58,122 | + 3,114 |
| East Ham Corp. ... | „ 13 | 2,365 | 2,302 | — 63 | 23½ | 54,660 | + 653 |
| Edinburgh Corp. ... | „ 6 | 14,404 | 14,607 | + 203 | 16½ | 249,983 | + 6,181 |
| „ Motor Buses ... | „ 6 | 3,493 | 3,760 | + 267 | 16½ | 63,269 | + 5,190 |
| „ Total ... ... | „ 6 | 17,897 | 18,367 | + 470 | 16½ | 313,252 | + 11,371 |
| Exeter Corporation ... | „ 17 | 939 | 800 | — 139 | 25 | 20,320 | — 1,572 |
| „ Motor Buses ... | „ 17 | 183 | 415 | + 232 | 25 | 7,915 | + 4,389 |
| „ Total .. ... | „ 17 | 1,122 | 1,215 | + 93 | 25 | 28,235 | + 2,817 |
| Glasgow Corporation... | „ 13 | 45,789 | 44,091 | — 1,698 | 15 | 642,433 | + 1,028 |
| „ Motor Buses ... | „ 13 | 6,063 | 9,426 | + 3,363 | 15 | 123,807 | + 47,017 |
| „ Total ... ... | „ 13 | 51,852 | 53,517 | + 1,665 | 15 | 766,240 | + 48,045 |
| Gloucester Corp. ... | „ 17 | 626 | 735 | + 109 | 24½ | 17,463 | + 3,701 |
| Grimsby Corporation | „ 13 | 1,536 | 1,756 | + 220 | 24 | 38,704 | + 4,149 |
| Halifax Corporation | „ 9 | 5,055 | 5,246 | + 191 | 23½ | 120,581 | + 13,540 |
| Huddersfield Corp. ... | „ 13 | 6,815 | 6,385 | — 430 | 24 | 152,944 | — 2,067 |
| Hull Corporation ... | „ 13 | 5,875 | 5,600 | — 275 | 24 | 135,661 | — 3,212 |
| „ Motor Buses ... | „ 13 | 1,362 | 1,717 | + 355 | 24 | 37,449 | + 5,591 |
| „ Total ... ... | „ 13 | 7,237 | 7,317 | + 80 | 24 | 173,110 | + 2,379 |
| Ilford Corporation ... | „ 13 | 1,551 | 1,499 | — 52 | 23½ | 35,925 | + 603 |
| Ipswich Corp. Trol.Bus | „ 13 | 1,317 | 1,376 | + 59 | 23½ | 32,470 | + 1,716 |
| Isle of Thanet ... | „ 10 | 2,047 | 1,758 | — 289 | 36½ | 33,234 | — 3,753 |
| Kilmarnock Corp. ... | „ 13 | 465 | 515 | + 50 | 17½ | 8,517 | + 374 |
| Lancashire Un. ... | „ 7 | 2,043 | 1,789 | — 254 | 35½ | 16,142 | — 4,122 |
| „ Motor Buses ... | „ 7 | 5,486 | 5,667 | + 199 | 35½ | 177,208 | + 24,038 |
| Leeds Corporation ... | „ 6 | 20,184 | 19,813 | — 371 | 22½ | 455,415 | + 9,498 |
| Leicester Corp. ... | „ 13 | 8,665 | 8,482 | — 183 | 24 | 198,779 | + 405 |
| Lincoln Corp. ... | „ 14 | 966 | 1,002 | + 36 | 24 | 22,768 | + 76 |
| Liverpool Corp. ... | „ 13 | 28,199 | 26,967 | — 1,232 | 23¼ | 638,298 | — 12,592 |
| „ Motor Buses ... | „ 13 | 3,037 | 3,215 | + 178 | 23¼ | 79,116 | + 12,462 |
| „ Total ... ... | „ 13 | 31,236 | 30,182 | — 1,054 | 23¼ | 717,414 | — 130 |
| London County Coun. | „ 17 | 83,164 | 81,858 | — 1,306 | 24¼ | 2,004,031 | — 16,331 |
| Luton Corporation ... | „ 10 | 459 | 447 | — 12 | 23¼ | 10,050 | + 283 |
| Maidstone Corp. ... | „ 10 | 174 | Nil | — 174 | 23½ | Nil | — 5,312 |
| „ Motor Buses ... | „ 10 | 347 | 277 | — 70 | 23½ | 6,570 | — 420 |
| „ Trolley Buses ... | „ 10 | 303 | 580 | + 277 | 23½ | 14,436 | + 7,196 |
| „ Total ... ... | „ 10 | 824 | 857 | + 33 | 23½ | 21,006 | + 1,464 |
| Manchester Corp. ... | „ 13 | 35,355 | 31,447 | — 3,908 | 24 | 764,145 | — 69,261 |
| „ Motor Buses ... | „ 13 | 4,963 | 8,584 | + 3,621 | 24 | 206,108 | + 86,241 |
| „ Total ... ... | „ 13 | 40,318 | 40,031 | — 287 | 24 | 970,253 | + 16,980 |
| Middlesbrough Corp. | „ 16 | 1,161 | 957 | — 204 | 24¼ | 25,093 | — 2,501 |
| „ Motor Buses ... | „ 16 | 591 | 521 | — 70 | 24¼ | 13,852 | + 1,157 |
| „ Total ... ... | „ 16 | 1,752 | 1,478 | — 274 | 24¼ | 38,945 | — 1,344 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | Latest Return. 1930 | + or — | Aggregate. Wks. | Aggregate. 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty. Corp. | Sept. 13 | 10,400 | 8,526 | — 1,874 | 23½ | 206,789 | — 33,284 |
| „ Motor Buses ... | „ 13 | 2,133 | 3,306 | + 1,173 | 23½ | 74,900 | + 25,488 |
| „ Total ... ... | „ 13 | 12,533 | 11,832 | — 701 | 23½ | 281,689 | — 7,796 |
| Newport Corporation | „ 6 | 1,721 | 1,097 | — 624 | 23 | 35,196 | — 3,154 |
| „ Motor Buses ... | „ 6 | 786 | 1,307 | + 521 | 23 | 20,100 | — 2,697 |
| „ Total ... ... | „ 6 | 2,507 | 2,404 | — 103 | 23 | 55,296 | — 457 |
| Northampton Corp. ... | „ 12 | 1,121 | 785 | — 336 | 23¾ | 25,310 | — 1,040 |
| „ Motor Buses ... | „ 12 | 702 | 1,236 | + 534 | 23¾ | 17,970 | + 2,216 |
| „ Total ... ... | „ 12 | 1,823 | 2,021 | + 198 | 23¾ | 43,280 | + 1,176 |
| Nottingham Corp ... | „ 11 | 6,777 | 5,518 | — 1,259 | 23½ | 134,867 | — 20,960 |
| „ Motor Buses ... | „ 11 | 2,469 | 3,393 | + 924 | 23½ | 78,186 | + 24,809 |
| „ Trolley Buses ... | „ 11 | 591 | 1,193 | + 602 | 23½ | 28,145 | + 14,362 |
| „ Total ... ... | „ 11 | 9,837 | 10,104 | + 267 | 23½ | 241,198 | + 18,211 |
| Oldham Corporation | „ 13 | 3,629 | 3,369 | — 260 | 25 | 83,529 | — 5,261 |
| „ Motor Buses ... | „ 13 | 1,994 | 1,901 | — 93 | 25 | 49,731 | — 1,180 |
| „ Total ... ... | „ 13 | 5,623 | 5,270 | — 353 | 25 | 132,960 | — 6,441 |
| Plymouth Corp. ... | „ 13 | 4,059 | 3,772 | — 287 | 23½ | 89,124 | — 3,883 |
| „ Motor Buses ... | „ 13 | 1,981 | 2,627 | + 646 | 23½ | 59,194 | + 12,708 |
| „ Total ... ... | „ 13 | 6,040 | 6,399 | + 359 | 23½ | 148,318 | + 8,825 |
| Portsmouth Corp. ... | „ 13 | 5,924 | 4,892 | — 1,032 | 24 | 108,975 | — 10,041 |
| „ Motor Buses ... | „ 13 | 2,533 | 3,632 | + 1,099 | 24 | 84,665 | + 32,754 |
| „ Total ... ... | „ 13 | 8,457 | 8,524 | + 67 | 24 | 193,640 | + 22,713 |
| Preston Corporation... | „ 10 | 1,800 | 1,696 | — 104 | 23¾ | 39,041 | — 1,988 |
| „ Motor Buses ... | „ 10 | 512 | 522 | + 10 | 23¾ | 12,141 | + 701 |
| „ Total ... ... | „ 10 | 2,312 | 2,218 | — 94 | 23¾ | 51,182 | — 1,287 |
| Rawtenstall Corp. ... | „ 7 | 864 | 641 | — 223 | 22½ | 14,877 | — 4,508 |
| „ Motor Buses ... | „ 7 | 540 | 683 | + 143 | 22½ | 16,080 | + 4,042 |
| „ Total ... ... | „ 7 | 1,404 | 1,324 | + 80 | 22½ | 30,957 | — 466 |
| Reading Corporation | „ 11 | 1,579 | 1,495 | — 84 | 24 | 34,108 | — 1,644 |
| „ Motor Buses ... | „ 11 | 909 | 1,000 | + 91 | 24 | 23,981 | + 2,169 |
| „ Total ... ... | „ 11 | 2,488 | 2,495 | + 7 | 24 | 58,087 | + 525 |
| Rochdale Corp. ... | „ 13 | 2,965 | 2,711 | — 254 | ... | 65,783 | — 4,934 |
| „ Motor Buses ... | „ 13 | 1,667 | 1,485 | — 182 | — | 37,188 | + 23 |
| „ Total ... ... | „ 13 | 4,632 | 4,196 | — 436 | ... | 102,971 | — 4,911 |
| Rotherham Corp. ... | „ 15 | 3,384 | 3,224 | — 160 | 24 | 66,425 | + 1,865 |
| Salford Corporation ... | „ 14 | 11,193 | 10,928 | — 265 | 23½ | 266,692 | + 100 |
| Sheffield Corp. ... | „ 13 | 21,345 | 19,904 | — 1,441 | 23¾ | 487,644 | — 14,813 |
| Southampton Corp. ... | „ 10 | 3,795 | 3,695 | — 100 | 24 | 82,983 | + 1,661 |
| „ Motor Buses ... | „ 10 | 878 | 923 | + 45 | 24 | 20,087 | + 2,497 |
| „ Total ... ... | „ 10 | 4,673 | 4,618 | — 55 | 24 | 103,670 | + 4,158 |
| Southend-on-Sea Corp. | „ 17 | 2,561 | 2,387 | — 174 | 24¼ | 58,360 | — 3,342 |
| „ Trolley Buses ... | „ 17 | 328 | 347 | + 19 | 24¼ | 8,432 | + 2,888 |
| „ Total ... ... | „ 17 | 2,889 | 2,734 | — 155 | 24¼ | 66,792 | — 454 |
| Southport Corp. ... | „ 13 | 1,494 | 1,405 | — 89 | 23½ | 33,714 | — 772 |
| „ Motor Buses ... | „ 13 | 462 | 454 | — 8 | 23½ | 10,971 | + 960 |
| „ Total ... ... | „ 13 | 1,956 | 1,859 | — 97 | 23½ | 44,685 | + 188 |
| St. Helens Corp. ... | „ 9 | 2,099 | 2,107 | + 8 | 23¼ | 47,558 | + 2,563 |
| Sunderland Corp. ... | „ 16 | 2,486 | 2,289 | — 197 | 24 | 61,468 | + 1,027 |
| „ Motor Buses ... | „ 16 | 301 | 747 | + 446 | 24 | 14,054 | + 8,747 |
| „ Total ... ... | „ 16 | 2,787 | 3,036 | + 249 | 24 | 75,522 | + 9,774 |
| Swindon Corp. ... | „ 10 | 939 | 958 | + 19 | 23¾ | 23,305 | + 4,716 |
| Wallasey Corp. ... | „ 13 | 1,393 | 1,208 | — 185 | 23½ | 30,626 | — 2,725 |
| „ Motor Buses ... | „ 13 | 2,253 | 2,358 | + 105 | 23½ | 59,128 | + 5,455 |
| „ Total ... ... | „ 13 | 3,646 | 3,566 | — 80 | 23½ | 89,754 | + 2,730 |
| Walsall Corporation... | „ 7 | 3,488 | 3,310 | — 178 | 23 | 79,401 | + 991 |
| Walthamstow Corp. ... | „ 13 | 2,473 | 2,439 | — 34 | 23½ | 59,191 | — 228 |
| Warrington Corp. ... | „ 11 | 890 | 921 | + 31 | 24 | 21,120 | + 50 |
| „ Motor Buses ... | „ 11 | 461 | 516 | + 55 | 24 | 15,957 | + 1,347 |
| „ Total ... ... | „ 11 | 1,351 | 1,437 | + 86 | 24 | 37,077 | + 1,397 |
| West Ham Corp. ... | „ 11 | 6,258 | 5,870 | — 388 | 23½ | 141,759 | + 766 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | „ 7 | 2,805 | 2,466 | — 339 | 23 | 56,637 | — 8,448 |
| „ Trolley Buses ... | „ 7 | 3,281 | 3,245 | — 36 | 23 | 80,214 | + 3,735 |
| „ Total ... ... | „ 7 | 6,086 | 5,711 | — 375 | 23 | 136,851 | — 4,713 |
| York Corporation ... | „ 10 | 1,109 | 1,034 | — 75 | 24 | 25,217 | — 130 |
| „ Motor Buses ... | „ 10 | 410 | 535 | + 125 | 24 | 12,148 | + 2,976 |
| „ Trolley Buses ... | „ 10 | 60 | Nil | — 60 | 24 | Nil | — 1,248 |
| „ Total ... ... | „ 10 | 1,579 | 1,569 | — 10 | 24 | 37,365 | + 1,598 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | Latest Return. 1930 | Aggregate. Wks. or *M* | Aggregate. 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Sept. 16 | £86,113 | £78,299 | 37 w | £3,037,619 | — £152,805 |
| Brazilian Traction $ | July | 4,335,895 | 4,081,018 | 7 m | 28,367,377 | — 5,543 |
| British Columbia $ | July | 1,156,720 | 1,196,239 | 1 m | 1,196,239 | + 39,519 |
| Buenos Aires Lacroze | Sept. 14 | 11,908 | 1,175 | 11 w | 116,832 | — 10,348 |
| Burma E. Sup. Co. Rs. | July | 64,649 | 66,444 | 12 m | 776,289 | — 17,071 |
| Calcutta ... Rs. | Sept. 13 | 128,537 | 108,735 | 36½ w | 4,082,614 | — 581,069 |
| Cape Town ... ... | July | 27,779 | 24,953 | ... | ... | .. |
| Carthagena & Herrerias | Aug. | 1,169 | 505 | 8 m | 6,855 | — 1,235 |
| Durban Corporation | July | 29,110 | 27,049 | 12 m | 288,972 | — 3,643 |
| East India ... ... | Aug. | 4,152 | 3,948 | 1 m | 3,948 | — 204 |
| Kalgoorlie ... ... | June | 1,660 | 1,753 | 6 m | 9,886 | + 25 |
| Madras (2 weeks) Rs. | Sept. 15 | 47,384 | 51,229 | 36 w | 793,187 | + 41,098 |
| Para ... ... | July | 15,044 | 14,816 | 8 m | 118,623 | + 521 |
| Port Elizabeth ... | July | 7,503 | 7,045 | ... | ... | .. |
| Rangoon ... Rs. | Aug. | 123,550 | 146,320 | 8 m | 1,197,255 | + 242,264 |
| Shanghai ... $ | Aug. | 335,172 | 386,112 | 7 m | 2,679,699 | + 49,478 |
| Singapore ... ...$ | Aug. | 130,000 | 142,000 | 11 m | 1,510,000 | + 165,000 |
| Winnipeg ... ...$ | July | 497,935 | 452,212 | 7 m | 3,725,716 | — 112,297 |

## RAILWAY RECEIPTS.

| 37th Week ended Sept. 14th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 276,000 | — 21,000 | 329,000 | — 17,000 | 605,000 | — 38,000 | -1,009,000 |
| L.M.S.R. | 558,000 | — 57,000 | 745,000 | — 97,000 | 1,303,000 | — 154,000 | -3,258,000 |
| L.N.E.R. | 398,000 | — 35,000 | 592,000 | — 86,000 | 990,000 | — 121,000 | -2,115,000 |
| S.R. | 359,000 | — 29,000 | 113,000 | — 5,000 | 472,000 | — 34,000 | — 398,000 |
| Totals | 1,591,000 | — 142,000 | 1,779,000 | — 205,000 | 3,370,000 | — 347,000 | -6,780,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | Latest Return. 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Sept. 13 | 290,300 | 285,500 | — 4,800 | 11,121,400 | + 614,500 |
| Lond. & Sub. Group | „ 13 | 46,900 | 45,300 | — 1,600 | 1,636,200 | + 98,900 |
| Metropolitan Railway | „ 13 | 36,600 | 36,000 | — 600 | 1,353,800 | + 20,200 |
| Liverpool Overhead | „ 14 | 1,783 | 1,597 | — 186 | 58,680 | — 4,217 |
| Mersey Railway ... | „ 13 | 4,247 | 4,299 | + 52 | 167,656 | + 4,022 |

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LONDON, SEPTEMBER 27, 1930.

## THE NEW ERA.

One of the chief points of discussion at the Municipal Tramways and Transport Conference should have been the new era in transport which is opening with the inauguration of the Road Traffic Act. Councillor Gledhill's paper invited debate in that sense, and the division of it into eighty numbered paragraphs with eight charts facilitated such treatment. Probably, however, the speakers agreed with the author that the past three years have witnessed such important developments in passenger transport on the roads that any forecast must necessarily be speculative. Therefore it is not surprising that nearly every speaker dealt with the paper from a standpoint that its author did not intend to emphasise, namely, the ever-present omnibus *versus* tramcar controversy. As opinion inclined generally to the view that within a decade only the larger tramway undertakings would remain, Mr. Stuart Pilcher cannot be blamed for recounting his latest experience at Manchester, as set forth in our issue of last Saturday. Yet we venture to assert that there is an explanation for Mr. Pilcher's statement that on the Altrincham route passengers preferred to ride in an express omnibus at 50 per cent. higher fares rather than use the most up-to-date tramcars with upholstered seats and running at high speed. Manchester's manager apparently forgot to mention that over five miles of the eight-mile track require immediate renewal, while the remainder "would last for further periods," according to his own report, in which he also stated that the maximum omnibus fare would require to be raised. There is only one form of transit worse than a tramcar on worn-out rails and cracked foundations, and that is a solid-tyred omnibus which is delaying its retreat to the traction museum at South Kensington. If the remarks of Mr. Pilcher at Harrogate are correctly reported, they may be further criticised in so far as he stated that the modern omnibus could take over all the "obligations" of a tramcar and yet run on a more remunerative basis. Leaving out of account the fact that the largest omnibus cannot carry so many persons as the double truck car, we would point out that the omnibus is not under an obligation to maintain its track and 18 ins. on either side thereof. Nor does it pay rates on its road, contribute large sums towards street improvements made chiefly in the interest of other vehicles, or grant workmen's fares. The present time would appear to be opportune for the Association to renew the agitation for a revision of the statute which requires tramway undertakings to maintain a track that is no longer subjected to wear by horse traction. Instead, the track and its margins increasingly suffer damage from all the heavy vehicles now using the roads. It is neither just nor logical that tramways and roads in which there is a tramway should be ineligible for an annual grant from the Road Fund. As Councillor Gledhill remarked, the cost of track renewal inflicts a charge three or four times the cost per mile compared with pre-war figures. If the Conference speakers feared to discuss the new era in transport, that tendency did not mark the speech of the Minister of Transport at the annual dinner, when he gave municipal and other operators some good advice. At that function last year, Mr. Morrison promised to do his utmost to satisfy the just claims of municipal tramways, and in less than a year he has secured the passage of the Road Traffic Act to the advantage of the nation generally.

### KINGSWAY SUBWAY ENLARGEMENT.

It is expected that the enlarged tramway subway between Victoria Embankment and Southampton-row, via the Kingsway, will be ready for reopening before Christmas. The work of reconstruction has been carried out under difficult conditions, but in much less time than was specified in the contract, which was entered into in 1929 with John Cochrane & Sons, of Westminster. The original subway, which was opened for traffic in 1908, provided for single-deck cars only. As reconstructed, the tunnel will take double-deck cars. The subway was closed for enlargement on February 3, 1930. The work consists of raising the roof and lowering the floor of the tunnel according to the conditions demanded by the grading of the new rail level. Under the Strand and Holborn crossings, the old subway was carried in twin cast-iron lined tunnels. At the Strand crossing, the upper half of each tunnel now forms the roof of new passages. Additional headroom has been obtained by breaking away the lower halves of the old tunnel and sinking the rail level about six feet. At the Holborn crossing, the old cast-iron tunnels have been removed, and the new subway is carried within a framework of steel pillars supporting the steel roof, which is just below the street level. The cost of enlarging the tunnels has been about £170,000. Over 300 men have been directly employed.

### INTERNATIONAL TRAMWAYS UNION.

SPECIAL MEETING IN PARIS.

At the Harrogate Conference of the Municipal Tramways and Transport Association, the President of the International Union of Tramways, etc., M. F. de Lancker, cordially invited the representatives of British tramways to attend a special meeting of the Union, which will be held in Paris on October 20 and 21. The object of the meeting is to witness demonstrations and to investigate the results of experiments in regenerative control as applied to tramway practice by the Paris Tramway undertaking, which were discussed at the recent congress at Warsaw.

A number of managers regard the occasion as of so much importance that they have accepted the invitation, and arrangements are being made which will enable the party to travel together. It is proposed to make the journey by road from Manchester, via London, to Dover, and from Calais to Paris. Managers interested should communicate with Mr. J. Beckett, general secretary of the Municipal Tramways and Transport Association. Mr. R. Stuart Pilcher, new president of the Association, and Mr. Beckett will officially represent the Association at the meeting.

### MANCHESTER AND THE TROLLEYBUS.

At a meeting of Manchester Corporation Transport Committee on Tuesday, it was decided that a deputation should be sent to visit a number of towns where trolleybuses have been installed, including Wolverhampton and Bradford. The deputation is to make a thorough investigation of this system and report to the Transport Committee. Councillor Isaac Brassington, chairman of the committee, said after the meeting that the decision did not mean that trolleybuses were to be experimented with in Manchester. The object was to examine the possibilities of this system of transport.

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## MUNICIPAL TRAMWAYS AND TRANSPORT ASSOCIATION.

ANNUAL CONFERENCE AT HARROGATE AND VISITS TO HUDDERSFIELD AND LEEDS.

A record attendance marked the 29th annual conference of the Municipal Tramways and Transport Association (Incorporated), which was held on Tuesday, Wednesday, Thursday, and yesterday (Friday) at Harrogate. Ninety-nine of the 103 authorities who are members of the Association sent representatives, Liverpool sending the largest delegation—eight members.

Among the visitors either at the conference or at the annual dinner were the Minister of Transport (Mr. H. Morrison), Mons. F. de Lancker (president of the International Tramways Union), and Mons. A. de Backer (secretary of the Union) Sir Ernest Bain, Mr. E. H. Edwardes (chairman of the Council of the Tramways, Light Railways, and Transport Association), Mr. L. Mackinnon (president of the Scottish Tramways and Transport Association), and Mr. J. Arnott, M.P., formerly chairman of Leeds Tramways Committee.

Both of the visitors from Brussels speak fluently in English, and gave much interesting information in conversation with regard to the services rendered by the Union to tramways on the Continent. It was remarked that this was the first occasion on which representatives of the Union had attended a tramway meeting in England since the Union held its Congress in 1902, in connection with a Tramway and Light Railway Exhibition at the Agricultural Hall, which was organised by THE TRAMWAY AND RAILWAY WORLD with the assistance of an honorary committee of leading tramway managers. On that occasion the visitors were officially welcomed by the Rt. Hon. Gerald Balfour, then President of the Board of Trade.

The charms of Harrogate, and the special programme arranged for their entertainment, attracted a large assembly of ladies. The opening event, on Tuesday evening, was a reception at the Spa Rooms by the Mayor (Alderman R. Annakin), and the Mayoress and the President (Alderman T. Canby, J.P.) and his daughter (Mrs. J. Hirst). A dance and entertainment concluded the evening.

The headquarters of the conference were at the Hotel Majestic, and there on Wednesday morning a meeting of the Council of the Association was held, followed by a civic welcome by the Mayor of Harrogate, who remarked that the tramway and omnibus undertakings represented by the delegates had a capital value of about £90,000,000. The President expressed the thanks of the members to the Mayor.

### THE PRESIDENT ON THE "MOST MOMENTOUS YEAR."

"We have just emerged from the toils of the most momentous year in the annals of the Association," said the PRESIDENT in his address. Without doubt, continued Alderman Canby, the year 1930 would be reckoned as the year of "The Reformation" in the road transport world, and of legislative rationalisation of the most comprehensive kind. Vast changes impended under the Road Traffic Act, which committed the most beneficent massacre in the history of local government. It repealed the licensing powers of 1,345 authorities without protest. For five years the Association had pleaded that local authorities were entitled to equality of opportunity combined with equality of obligations and responsibilities in the provision of the means of road passenger conveyance. In justice, they were entitled to priority as long-established operators. The most progressive of them had been compelled to look on while private enterprise in this branch of public service had reaped great rewards. Some local authorities and companies had obtained, since the Notts and Derbyshire Traction Act, 1928, was passed, powers which protected their transport services from competition within limits, so long as they were adequate and satisfactory, to the point of monopoly. The last case was that of Glasgow. Some authorities had resorted to some measure of protection by imposing higher fares upon competitive services, but that course, apart from the difficulty of enforcing it, and the ingenuity displayed in dodging it, was not satisfactory. It was invidious and unpopular, and had led to friction between the operating and neighbouring authorities; moreover, it had not been effective. Under the Road Transport Act, local authorities were given powers to operate omnibuses. Of the 103 members of the Association, 86 had obtained omnibus powers and were exercising them. Part V, however, should be of considerable service to them. Adverting to the doubt expressed in some quarters whether the present wages of the employees were just in comparison with those paid in the great industries of the country, the President stated that the wages were stabilised by the award of 1924. If the sliding scale based on the cost of living index had remained in force, wages would have been 4s. per week less than at present. Notwithstanding this, the operative employees of Liverpool Tramways recently applied for an increase of 4s. per week, although their present wages were higher than those in the highest group affected by the stabilising decision, but the Industrial Court refused the application. In the face of the unchecked and growing industrial depression and unemployment, it had become a duty of public men who desired to deal justly to consider afresh the relativity of wages of men engaged in sheltered industries with those of their fellow-men in competitive trades.

BAILIE BURT (Glasgow) said they were not going to solve their problems by reducing wages. Their object should be to raise low wages. He had never found the low wage man nearly as efficient or valuable as the man who was well paid. They often heard suggestions about reducing wages, but he had never heard anyone try to reduce the enormous price which they often had to pay for land in order to extend the tramway undertakings.

BAILIE P. J. DOLLAN (Glasgow) was certain no ratepayer in Glasgow wanted to save on the rates by exploiting tramway employees. They wanted private companies to be brought up to their own standard. If they did that, municipalities would have very little fear in regard to competition in their services.

BAILLIE BURT (Glasgow) moved a vote of thanks, which was seconded by COUNCILLOR A. E. PAPE (Ramsbottom). The President then called on M. F. DE LANCKER (president of the International Tramways Union), who cordially invited and urged British tramway undertakings to become members of the Union. It was possible to arrange for an English version of the speeches at some expense. He also invited representatives of tramways in this country to attend a meeting in Paris in October to hear the results obtained by the Paris Tramways in regenerative control. His remarks were very warmly received, and it is probable that a number of corporations will decide to become members of the Union.

MR. R. STUART PILCHER thanked Mons. de Lancker for his message and invitation, and hoped that British participation in the Union would be encouraged by what they had heard from Mons. de Lancker.

COUNCILLOR I. BRASSINGTON (Manchester) also urged the claims of the Union to British support.

The PRESIDENT next presented the cheques and medals won in the Essay Competition, 1930, as published in THE TRAMWAY AND RAILWAY WORLD of September 6.

### THE ANNUAL GENERAL MEETING.

At this meeting the Council's annual report was presented and adopted after references had been made to the danger of allowing it to go out from the meeting that there was a desire to reduce wages in the tramway industry.

Election to honorary membership was announced of Mr. H. Mozley and ex-Alderman Higham.

The accounts, showing a credit balance of over £400, were adopted after a suggestion that the competition essays should be printed in pamphlet form and distributed among all the members of tramway staffs. The Council promised to consider the suggestion.

The meeting then elected officers and Council for next year as follow:—

President, Mr. R. Stuart Pilcher (Manchester); vice-president, Alderman A. G. Ellaway (Birmingham); hon. treasurer, Mr. A. R. Fearnley; hon. solicitor, Mr. F. H. C. Wiltshire; members of Council, Alderman W. Greenwood (Salford), Alderman G. Hill (Burton-on-Trent), Mr. C. Furness (Blackpool), Mr. C. Jackson (Plymouth), and Mr. E. C. Owen Silvers (Wolverhampton).

### THE TRANSITION IN ROAD PASSENGER TRANSPORT.

On Wednesday afternoon, COUNCILLOR A. H. GLEDHILL, J.P. (chairman of Halifax Tramways and Omnibus Committee), submitted a paper entitled "The Transition in Road Passenger Transport, with special reference to the changes that have taken place between 1928-1930." The author instanced the need for such reforms as would be instituted under the Road Traffic Act, 1930. Whatever might be the merits of de-rating, it was unfair to the motor industry to transfer such a burden as was represented by the 4d. per gallon tax on petrol from the manufacturing community and place it upon a single industry. Any tax levied on motor transport in excess of the actual extra cost of maintaining the roads due to that transport was victimisation of a particular industry. The increased weight of traffic had added to the burden of tramway undertakings due to the fact that they had to maintain their tracks, plus 18 ins. at each side. Tramway operators had a sound argument for demanding that some portion of the yield from the tax levied on motor transport should be paid to them to meet the increased cost of road maintenance. The rapid development in road transport had become a serious challenge to municipalities and railway companies. Over £80,000,000 had been invested in tramways and £1,222,581,206 in railways. It would be a national disaster if the competition were allowed to proceed in such a way as to make this capital unremunerative and the undertakings ineffective. If tramways were to be put out of business by unrestricted competition, very heavy charges would fall upon the highway authority and ultimately upon the ratepayers and the Road Fund. Local authorities had been increasingly attacked by long-distance services worming themselves into shorter-distance services. The regulation of long-distance services by individual local authorities was impossible; the judgment in the Burnley case heard in the Divisional Court made that point clear. Attempting to forecast developments under the new Act, the speaker thought that the tendency would be for the smaller non-statutory undertakings to drop out as separate entities, passenger transport becoming more and more a controlled monopoly shared by the municipalities, railway companies, and large companies. In less than two years the railways had obtained a part interest in 14,000 motor coaches, and already the coaches partly owned by them carried half as many passengers per year as were carried on the railways.

MR. R. STUART PILCHER (Manchester) adverted to a suggestion in Councillor Gledhill's paper that omnibus stopping places and stands in busy streets could be done away with by the local authority turning a slum area into an omnibus station. Manchester, he said, had decided to purchase a central site on which to erect a station. Concerning the modern omnibus, he said that his experience was that it could take over all the obligations of a tramcar and yet run

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on a more remunerative basis. On the Altrincham route, up-to-date cars running at 30 m.p.h. were being deserted in favour of an express omnibus with 50 per cent. higher fares.

MR. R. H. WILKINSON (Bradford) expressed his opinion that tramways were doomed. (A Voice: In Bradford.) He would go so far as to say that in ten years there would hardly be a tramcar left in England. (Laughter.)

Councillor J. H. Whittaker (Todmorden), Mr. J. M. Calder (Reading), Mr. J. Barnard (Bolton), Mr. A. C. Fenwick (Bury), Mr. W. R. Elliott (East Ham), Alderman W. Greenwood (Salford), Mr. Charles Furness (Blackpool), and Councillor T. Steen (Bury) also spoke.

MINISTER'S ADVICE TO MUNICIPALITIES AND CLAIM "JUMPERS."

The annual dinner was held on Wednesday evening at the Hotel Majestic, when the President submitted "The Minister of Transport."

MR. HERBERT MORRISON, in reply, remarked that it was natural that the Association should be in a rejoicing mood at the incorporation of Part V in the Road Traffic Act. For years the municipalities had complained of the expense and trouble of promoting private Bills when they wanted to run an omnibus service. Part V incorporated all the essentials of the Association's Omnibus Bill. If the municipalities were to take their proper place in the provision of transport services, they must come together, or they would be swamped by large-scale private enterprise. The municipality must run its trading undertaking on the best commercial lines. The efficient general manager must be made to feel that he was a business man first, and short of committing his council on questions of policy and finance, he and his chairman must have the right to take urgent decisions, subject to reporting to the committee. The Road Traffic Act would enable the Minister of Transport to take big strides in securing order on the King's highway. Congestion, overcrowding, and lack of regulation, besides meaning danger to life, were contrary to a sound standard of public economy, in view of the monetary value of road space. The presence of a large number of motor coaches in places like Central London was not to be recklessly tolerated, and all concerned in the rushing of new coach and omnibus services on to the roads in London and elsewhere should not assume that he would submit to accomplished facts when the Road Traffic Act came into force. If people were jumping claims, they were jumping at their own risk. He made that point clear when the Act was read a third time.

The annual dinner was a very pleasant and successful function. Over 400 delegates, ladies and guests were present, but the spacious ballroom of the Hotel Majestic was not so crowded as to be uncomfortable. The speech of the Minister of Transport, who spoke for about half an hour, gave a candid review of Mr. Morrison's ideas as to the methods by which municipal authorities should carry on their transport undertakings. His congratulations to the Association on the part they had taken in the work in connection with the Road Traffic Act were evidently greatly appreciated by the Council and the members.

THURSDAY'S PROCEEDINGS.

After the meeting of the Managers' Section on Thursday morning, the discussion on Alderman Gledhill's paper was resumed, and was again lively and prolonged. The following took part in it: Mr. C. Clarke (Birkenhead), Mr. A. C. Baker (Birmingham), Councillor W. T. Newling (East Ham), Councillor H. Dalton Henderson (Perth), Bailie P. J. Dollan (Glasgow), Councillor R. Edwards (Liverpool), Alderman I. J. Curwen (Lancaster) and Councillor T. Steen (Bury).

The feature of the discussion was the unanimity in favour of co-ordination of transport facilities over large areas—a continuation of the point made by Mr. Morrison that the "parish pump mind" must go.

Councillor Henderson suggested that it would soon be time to talk about municipal air transport. Aerodromes were needed everywhere.

Bailie P. J. Dollan said there was greater need for revision and reform on the committee side than on the management side. The main fault of municipal transport administration was that it was not quick enough to adapt itself to changes and increasing needs. He suggested that towns in Lancashire should evolve a new system of ownership and direction on the lines of a unified corporation managing the whole system. If the same degree of research were put into the development of tramcars that was put into the development of omnibuses it might be possible to produce within the next ten years a car to travel at sixty miles an hour. He did not agree that municipalities should make themselves responsible for amenities at omnibus stations such as had been suggested.

Councillor Gledhill, replying, said he was disappointed that the debate had centred on the question of tramcar *v.* omnibus. This was a question which each authority must settle for itself. The day of the tramcar could not be said to be over because some small areas now found it better to operate omnibuses. It was not over in the bigger centres where the organisation had been modernised.

EXPERIMENTS WITH DIESEL-ENGINE OMNIBUSES.

Thursday afternoon was devoted to a paper by MR. W. VANE MORLAND, general manager and engineer, Walsall Tramway and Motor Services, on "The progress made with the development of the heavy oil engine." The Sheffield and Walsall Corporations' experiments showed, he said, that the fuel costs of operating a double-deck omnibus was approximately ½d. per omnibus mile. A comparison of the fuel costs of a single-deck petrol omnibus at Walsall with those of a heavy oil engine omnibus showed a saving of £175 per annum. On petrol the average number of miles per gallon was 8; on oil fuel 18. Assuming that petrol was tax free, the saving on present prices would be £11,250 per annum per 100 vehicles in commission. The Associated Equipment Co. had evolved the Acro system of high-speed oil engine for road vehicles, and were putting the first hundred into production for immediate sale. The author did not wish to create the impression that the stage of development entitled omnibus operators to press for deliveries of large fleets of oil-engine omnibuses, but the haulage industry need have no fear in adopting it, as a highly refined engine was not necessary for them. The latest types of petrol-engine omnibuses had reached a high stage of refinement, and any attempt to inflict on the public a vehicle in any way inferior would be strongly resented. It should also be given a trial in coach or country omnibus services, and experimentally by local authorities. Besides the amazing fuel economy, its immunity from fire weighed heavily in its favour. If the heavy oil engine could displace the petrol engine in road industry generally, an enormous saving would be effected in the nation's bill for imported fuel.

Mr. Vane Morland's paper, together with the discussion, constitutes one of the most valuable contributions to the proceedings of the Association for many years. The managers, naturally, took the most prominent part in the discussion, and many exceedingly useful technical points were raised. It was the general opinion that the paper and discussion would lead to notable developments in the near future.

Mr. Morland mentioned, as an addition to the paper, that if he were the director of a large freight haulage undertaking, he would not order any more petrol-driven lorries, so satisfied is he with his experience of the Diesel type of engine at Walsall, which, by the way, is a marine type. Since that was put into service, however, the Crossley Motor Co. has equipped a completely British-made vehicle to the order of the Leeds Corporation, which, through the kindness of Mr. Horsfield, the Leeds general manager, was on exhibition at Harrogate. Many of the delegates had the experience of riding in it.

The discussion was contributed to by Mr. A. R. Fearnley (Sheffield), with whom Mr. Vane Morland has been carrying out considerable research work; Mr. C. Owen Silvers (Wolverhampton), Councillor Graham Ford (Leeds), who urged that municipalities should bear some portion of the expense, with the manufacturers, of the research work necessary to perfect a Diesel engine for road transport work; Mr. J. M. Calder (Reading), Alderman T. Woffenden (Huddersfield), Mr. A. C. Baker (Birmingham), Mr. R. L. Horsfield (Leeds), Councillor I. Brassington (Manchester), Bailie Burt (Glasgow), Mr. R. H. Wilkinson (Bradford), Councillor T. H. Burton (Liverpool), Mr. G. Rock (Lincoln), and Councillor O. M. Flinn (Coventry).

As bearing upon the Leeds experiment, it may be stated that Mr. Graham Ford (vice-chairman, Leeds City Tramways) said the time was ripe for taking a bold stand and for making it clear to committees that in the heavy oil engine there were possibilities of great development. If the residuals of gas production could be used to produce oil for road transport it would put gas undertakings on a sound economic foundation.

Mr. R. L. Horsfield, the Leeds general manager, said he hoped that the vehicle would prove economical in service.

It indicates the interest taken in the paper when it is stated that the attendance was a full one to the end, and that the discussion was carried on long after the time for closing the meeting according to the official programme.

A vote of thanks was moved by Alderman A. J. Bailey (Sheffield), and seconded by both Alderman G. Burke (Blackburn) and Councillor J. D. McClure, chairman, Belfast Transport Committee.

THE PRESIDENT THANKED.

On the motion of Alderman Banton (Leicester), a very hearty vote of thanks was accorded to the President for his services during the important year of his office.

In expressing his thanks, Alderman Canby made a very cordial acknowledgment of the assistance he had received from the Council, and especially from Mr. Beckett, the general secretary, to whose services he paid an enthusiastic tribute.

After luncheon on Thursday the official photograph of the Conference was taken in the grounds of the Hotel Majestic.

COACH JOURNEYS TO HUDDERSFIELD AND LEEDS.

Yesterday (Friday) morning motor coaches conveyed the delegates to Huddersfield, where luncheon was partaken of at the Drill Hall by invitation of the Mayor (Alderman Walker T. Priest, J.P.) and the chairman, vice-chairman and members of Huddersfield Tramways Committee. In the afternoon the large party went on by coach to Leeds. At the invitation of the Leeds Tramways and Transport Committee the visitors partook of tea at "Temple Newsam." After the repast the return journey to Harrogate was made.

As usual, all the arrangements for the Conference were excellently made and were carried out admirably. Mr. J. Beckett, the general secretary, and Mr. A. W. Chadwick, the assistant general secretary, were indefatigable in their efforts to care for the comfort and convenience of members, many of whom, both publicly and privately, expressed their appreciation of the admirable staff work.

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**Doncaster Trolleybus Extension.**—The latest section of the Doncaster Corporation Tramways to be converted for trolleybus operation was inspected recently by Lieut.-Col. Woodhouse, of the Ministry of Transport. This is the seventh section of the tramways to be converted for the new form of traction. The total conversion is now eleven miles, and nineteen Karrier-Clough six-wheel 60-seat double-deck trolleybuses are in operation.

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## TRANSPORT REORGANISATION IN VICTORIA.

A Bill introduced by the Minister of Railways in the Victoria Legislative Assembly provides for the co-ordination of the railway, tramway and motor omnibus services in the State. It creates a department of transport with a Minister of Transport as its administrative head, and will be composed of railway, road transport and tramway branches. The railway department will be controlled as at present, but the existing Tramways Board will be abolished when its term expires at the end of the present year. The tramways will be placed under the control of a Commissioner of Tramways, who will be appointed for five years at a yearly salary not exceeding £1,750. A deputy commissioner is also proposed. The Tramways Commissioner will be unable to purchase material outside Victoria without permission of the Minister.

All railways, tramways and motor omnibus Acts will be administered by the department. The Country Roads Board will control motor omnibuses, and prescribe routes, both in Melbourne and in the country, and the Metropolitan Omnibus Advisory Committee will be abolished. The Bill provides for the appointment of an Advisory Committee, to consist of the Minister of Transport as chairman, a nominee of each of the railways, tramways, Country Roads Board, manufacturers and sellers of motor vehicles, and owners of freight or passenger motor vehicles combined, metropolitan municipalities, and of other municipalities, or a total of seven members. A section of the Bill brings stage motor omnibuses under the same section as omnibuses, allowing the Minister to define not only the route but the number of omnibuses to be run.

## MISCELLANEOUS NEWS AND NOTES.

**New Traction Poles.**—Southend Transport Committee has decided to erect new span poles in certain streets at a cost of £500.

**More Omnibuses for Bury.**—The Bury, Lancs, Tramways Committee has decided to purchase four additional double-deck omnibuses.

**Glossop Corporation** has decided to remove the tramway track in Station-road, Hadfield, and to repair the road at an estimated cost of £950.

**Motor Coach Station at Victoria.**—On a corner site of one and a half acres, facing the west side of Victoria Station, a motor coach station is to be erected.

**Preston Proposes Trolleybuses.**—The Corporation of Preston has decided to introduce a Bill in the next session of Parliament asking for powers to operate trolleybuses.

**Glasgow's Reconditioned Cars.**—At present reconditioned tramcars are being turned out of the Corporation's departmental workshops at the rate of five per week. All the cars are now electrically heated.

**Motorman Dies on Tramcar.**—Motorman E. J. Lane, aged 56, collapsed and died while driving a tramcar along Whitehorse-road, Croydon. The conductor stopped the car by operating the rear switch and applying the brake.

**More Omnibuses for Southport.**—Two tramway routes at Southport are to be abandoned and omnibuses substituted. The Tramways Committee has decided on the purchase of fourteen double-deck omnibuses at a cost of over £20,000.

**Tramway Routes to be Abandoned at Reading.**—The application by Reading Corporation to abandon the tramway services in Bath-road, Castle-hill, Castle-street and St. Mary's Butts, has been granted by the Ministry of Transport.

**Relaying a Norwich Tramway Route.**—Work was begun on September 22 in relaying the tramway track in Magdalen-street, Norwich. It will be carried out in two sections, but the second half will not be done until the next financial year.

**Morecambe Tramways Committee** has asked the general manager to report upon the advisability of running omnibuses outside the borough. The Watch Committee has obtained sanction to borrow £1,250 for the construction of an omnibus station.

**Coventry Tramways** have been extended for a short distance from the Bull's Head Inn, Stoke, to Uxbridge-avenue, the work being inspected and approved by Col. Woodhouse, of the Ministry of Transport, on September 23, when the extension was opened for traffic.

**New Garage for Southend.**—The borough surveyor of Southend has been directed to prepare plans for submission to the Transport Committee of a modern type garage which is required in view of the proposed purchase of more omnibuses and the extension of the trolleybus routes.

**More Omnibus Routes for Nottingham.**—The Corporation of Nottingham proposes to operate omnibuses on six routes in the urban districts of Arnold, Carlton, and West Bridgeford, and in the rural districts of Basford and Bingham, and has applied for the consent of the Minister of Transport.

**Reduction in Price of Petrol.**—The reduction of 2d. per gallon in the price of motor spirit, announced on September 22, will mean a considerable saving to municipal authorities operating passenger vehicles, and it will be welcomed particularly in districts where trade depression has affected the receipts.

**Omnibus Competition Closes Railways.**—Four railway services have just been closed for passenger services owing to omnibus competition. First, the Welsh Highland Railway from Portmadoc to Dinas Junction, near Caernarvon, which was opened only eight years ago; second, the narrow gauge line from Portmadoc to Blaenau Festiniog; third, the Alnwick and Coldstream branch of the L.N.E.R., 30 miles long; and the nine miles of the L.M.S. system from Skipton to Grassington.

**Brighton Merger Arbitrator.**—Brighton Town Clerk has reported that Thomas Tilling, Ltd., have agreed that the appointment of an arbitrator under the agreement for the constitution of a transport board for the borough should be made by the president of the Institution of Chartered Accountants, if such appointment is required.

**Saving on Petrol Price Reduction.**—At a meeting of Belfast Tramways Committee on Tuesday, Councillor R. J. R. Harcourt stated that the reduction in the price of petrol announced this week would mean a saving to the department of about £1,600 per annum, the consumption being from 180,000 to 200,000 gallons in the year.

**Electricity in the United States.**—Mr. C. M. Ripley, of the General Electric Co. of the United States, stated at a luncheon in London recently that the electricity generated in the United States totalled one billion units. Considered in all its branches the electrical industry was now the third industry in point of view of size in the United States.

**Manchester Omnibus Guide.**—A guide to the omnibus services was issued recently by Manchester Corporation Transport department. Another useful publication by the department is a map that gives particulars of the tramway and omnibus routes, together with information regarding starting points, fares, and places of interest.

**Municipal Garage for Glasgow.**—The Transport Committee, on September 18, decided to recommend the City Council to proceed with the erection of a garage at Anniesland to accommodate 200 omnibuses. The initial expenditure will be £35,000, and the total cost is estimated at £80,000 to £90,000. Building ideas gained by the deputation which visited Germany some months ago will be used.

**Pensioners and Free Tramcar Rides.**—Old-age pensioners have written to the Liverpool Press expressing gratitude to the Tramways Committee for the free passes on the tramways. One writer suggests the deletion of the paragraph which absolves the Corporation from third-party compensation on the ground that it is mean to expect old-age pensioners to contract themselves out for the sake of a penny ride.

**Belfast Tramways Committee.**—At a special September meeting of Belfast Corporation the following members were appointed as the Tramways Committee:—Chairman, Councillor J. D. McClure; vice-chairman, Councillor R. J. R. Harcourt; members: Alderman J. A. Doran, Councillors Lambe, Chambers, McCoubrey, J. Maguire, George Gray, A. McBride, Sweeney, J. Malcolm, Boyle, Noble, F. J. Holland and H. McKibbin.

**Aberdeen Proposal for Fares at Cost.**—Councillor J. D. Munro has given notice of motion that the Aberdeen Town Council affirm the principle of the Tramways Department being conducted, and the fares on the tramcars and omnibuses being regulated as far as possible, so that the services shall be available at cost price. If the proposal is carried an inquiry will be made in order to bring the fares into line with the declaration.

**Lowestoft Tramways.**—Councillor A. Evans, chairman of the Lowestoft Tramways Committee, states that the rumour that the Council propose to abandon the tramways at the end of the year is wrong. They are taking advantage of the offer by the Unemployment Grants Committee of an increased grant for the removal of the disused tramway track, the Council having already decided to remove this track within the next five years.

**Colwyn Bay Tramway Section Closed.**—The Llandudno and Colwyn Bay Electric Railway, Ltd., having been permitted by Colwyn Bay Council to double the tramway track on the eastern side of the town, have agreed to take up the rails for the remaining mile and a half, where the road is rather narrow. On September 20 tramcars ceased to run on the section from the centre of the town to the eastern terminus at Old Colwyn. Omnibuses are running over the route.

**Drivers' Fitness Under the New Act.**—A conference of those concerned took place at the Ministry of Transport on Tuesday to discuss provisions as to the physical fitness of motor drivers under the Road Traffic Act. A draft form of declaration was considered and eyesight tests were discussed, and it is understood that extremely poor sight and liability to fits will disqualify applicants for a licence. A conference was also held on Wednesday, when representatives of insurance companies discussed with officials the insurance of third-party risks.

**Successful Tramways at Hong Kong.**—To those who assume that in the parrot cry of the popular Press "tramways are doomed," the following extract from the speech from the chair at the last annual meeting of the Hong Kong Tramways will be of special interest. "If the passengers," said the Hon. B. D. F. Beith (who is a brother of Ian Hay), "that we carried last year by tramcar had at the same fares been carried by petrol omnibuses, not only would we not have been paying a 20 per cent. dividend, but we would not have been paying any dividend at all.

**Pontypridd Inaugurates Trolleybus System.**—The trolleybus system which has been installed by the Pontypridd Urban Council in substitution of the tramways on the route from Treforest to Cilfynydd, a distance of 3.3 miles, was inaugurated on September 18 by Mr. T. I. Mardy Jones, M.P. Capt. Arthur Seaton, J.P., chairman of the Council, presided at a luncheon, and Mr. Mardy Jones congratulated the Council on its courage. The vehicles, supplied by the English Electric Co., Ltd., of Preston, are 32-seaters. The overhead construction was carried out by Clough, Smith & Co., Ltd., of 36, Victoria-street, London.

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**Southend Considering Another Trolleybus Route.**—At the last meeting of Southend Transport Committee the question of extending the trolleybus route along Fairfax-drive to a point near Nelson-road was deferred until the next meeting, and the general manager was asked to obtain further particulars of the cost of the traction cables required.

**Omnibus Station in Falkirk.**—A large omnibus station is to be erected in Falkirk. The first part of the scheme has been sanctioned by the Dean of Guild Court, and work will begin on the site at Callendon. The station will form the hub of Central Scotland's omnibus traffic, and from it vehicles will run to all parts of Scotland.

**The Anglo-Argentine Tramways Co.** has decided to proceed with the construction of the second of the three subway lines for which it holds concessions. The first is already built, and work on the second was begun in August. Work has been delayed owing to the company's inability to obtain from the municipality permission for a basic point-to-point charge of 15 cents as against the 10 cents for surface tramways and on the subway now open. A Spanish group was recently granted a concession for a subway and agreed to the 10-cent fare. It is hoped that the municipality will later come to terms with the English company.

**Port of Spain Inquires About Trolleybuses.**—The Mayor and Town Clerk of Port of Spain, Trinidad, have visited Hastings to inquire into the working of the trolleybus system, and particularly seeking information about the transference of tramways operated by a company to a municipality, which is the course proposed in Port of Spain. Information was supplied by the town clerk and the general manager and engineer of the Hastings Tramway Co., Mr. W. Vincent Edwards. The Port of Spain tramways are operated by the Trinidad Electric Co., whose office is at Halifax, Nova Scotia. The company also supplies the town's electricity for light and power.

**Railway Electrification.**—The electrified suburban services of the Illinois Central Railway in the Chicago area have shown again considerable increase in earnings for the first six months in 1930 over the same period of a year ago. "Electric Traction" of Chicago says that this gain has been effected in the face of declining revenue from main line passengers and goods traffic. Since 1925 there has been an increase of more than 98 per cent. in suburban business of the company. Substantial savings shown in the figures for suburban passenger services are effected by the more expeditious handling of goods trains in the suburban area by electric locomotives.

**Omnibus Competition at Derby.**—In his report for the year ended March 31, Mr. P. W. Bancroft, manager of Derby Corporation Tramways and Omnibuses, states that there will have to be a check to omnibus competition with the tramways if the undertaking is to be restored to a satisfactory financial basis. Omnibuses have taken a large proportion of the passengers who used to walk from points beyond to the tramway terminus, and the increase of the Corporation's omnibus services has also affected tramway receipts. The rush-hour omnibus services are unprofitable, as they hold up a large proportion of the fleet for very short periods of work. The total receipts for the two systems constitute a record.

**Brush Electrical Engineering Co.**—Certain directorial and managerial rearrangements have been made by the Brush Electrical Engineering Co., Ltd., with a view to giving additional effect to the co-partnership scheme. Mr. W. Johnstone, by his own desire, relinquishes his appointment as managing director, remaining, however, on the board and undertaking other important duties, with residence in London. Mr. A. T. Brotherton has been appointed a member of the board with special duties as local director at Loughborough. Mr. W. Pearson, who has been for many years with the company, has been appointed general manager. Mr. E. Garcke has agreed to serve for another year and to assume the title and duties of chairman and managing director.

**Trolleybuses in South Africa.**—Guy Motors, Ltd., of Wolverhampton, have imported a 60-seat trolleybus into South Africa for demonstration purposes. It has been seen at work at Cape Town, where, by arrangement with the Cape Town Tramways Co., it has made several successful runs with an improvised overhead system. A deputation was expected from Johannesburg to witness a demonstration. The vehicle, which is accompanied by Mr. F. J. Woodward, a director of the company, is to be taken on tour to other important centres of the Union. It will be remembered that recently Mr. J. A. Bromley, general manager, Durban Corporation Tramways and Motors, recommended the gradual installation of the trolleybus in substitution for tramways. Johannesburg Council, which is reorganising its tramways department, is now considering this form of traction.

**Torquay and Paignton Tramways.**—In order to clear up misunderstandings prevalent among the ratepayers, the chairman of the Highways Committee was asked, at a recent meeting of Torquay Corporation, what would be the position of the Tramways Company in 1935. Councillor Folland replied that it was provided by the Company's Act that if before August 14, 1935, the Corporation require the company to sell to the Corporation the tramways in the borough, the company must sell and the Corporation must buy on terms of fair value thereof as a going concern, but without any allowance for compulsory purchase. If Paignton Council did not exercise their option for purchasing so much as was not in the Torquay district then the Torquay Corporation has to buy the whole undertaking. The Corporation could not purchase at scrap price unless the company ceased to work the tramways or became insolvent.

## PERSONAL.

**Councillor Irvine Smith,** chairman of Bradford Tramways Committee, owing to the demands of his business, has decided not to seek re-election to the City Council.

**Colonel J. B. Neilson,** C.M.G., D.S.O., C.A., has been appointed to a seat on the board of Vickers-Armstrong, Ltd., to fill the vacancy caused by the death of Mr. G. G. Sim.

**Mr. A. E. Halliwell** has resigned his position as a director of Phillips & Sons (Chiswick), Ltd., manufacturing electrical and mechanical engineers and contractors, 42, Waterford-road, S.W.6.

**Mr. J. M. Calder,** general manager and electrical engineer of the Reading Corporation Tramways, has been invited to become a vice-president of the newly-formed Society of Engineers for the district.

**Alderman Robert Mell,** chairman of Hull Tramways Committee, was on September 25 chosen as Lord Mayor of the city. There were no other nominations. Alderman Mell is a railway supervisor and a Socialist.

**Mr. H. Voyce,** who for the past five years has been the A.E.C. sales and service area manager for Yorkshire, has joined the firm of Oswald Tillotson (1929), Ltd., the new A.E.C. northern distributors, as sales representative for the county.

**Sir Basil Mott,** of Mott, Hay & Anderson, of Westminster, has been appointed by Glasgow Corporation to advise them on the proposed bridge across the Clyde at Finnieston. The motion for the appointment was agreed to by 45 votes to 33 cast for Sir Henry Maybury.

**Mr. Victor Watlington** has resigned his appointment as managing director of the English Electric Co., Ltd., but retains his seat on the board. **Mr. George H. Nelson, M.I.E.E.,** who has joined the board, has been appointed managing director, and will take up his appointment early in October.

**Mr. Charles Sprowson** has resigned his position as traffic superintendent of Stockport Corporation Tramways after 29 years' service. His colleagues have presented him with a gold albert, a wallet of notes, and a pipe, the presentation being made by Mr. A. T. Eardley, the manager. He is succeeded by Mr. C. F. Wolsey.

**Mr. L. C. F. Bellamy,** general manager of the Hong Kong Tramways Company, and Mrs. Bellamy, will leave Liverpool on Friday, October 10, by the "Duchess of Atholl" for Hong Kong (via Canada and Japan). Mr. Bellamy's many friends in this country will be interested to know that he has recently been elected vice-president of the Hong Kong Automobile Association, and that he has also been made a Justice of the Peace.

**Bradford Tramways Management.**—The deputation from Bradford Tramways Committee, which interviewed Mr. C. J. Spencer in London with the object of inducing him to return as tramways manager in succession to Mr. R. H. Wilkinson, reported on September 22 that Mr. Spencer was willing to give expert advice on the tramways situation. Evidently, however, Mr. Spencer is unlikely to return as manager, but Councillor W. Hodgson, vice-chairman of the Committee, has stated that a new manager is not likely to be appointed until Mr. Spencer's views have been discussed.

The death has occurred at Torquay of **Mr. J. F. Rockhey, J.P.,** who was at one time Mayor of Torquay and a director of the Torquay Tramways Co. Mr. Rockhey was 84 years of age.

**Mr. H. Kenworthy,** the oldest employee of the Metropolitan Electric Tramways, Ltd., when he retired a few years ago, and who had been successively a driver of horse, steam and electric tramcars, has died at the age of 73. He patented a sanding device for tramcars.

## FINANCIAL.

**Halifax Corporation Tramways** for the year ended March 31 made a net profit of £379, following losses for the past four years totalling £38,638. The income was £181,105, and the expenditure £180,726. On the omnibuses there was a loss of £11,180. The deficiency on the tramways revenue account at March 31 was £73,724, of which the omnibus undertaking was responsible for £34,761.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended September 24 amounted to £82,696, a decrease of £890 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to September 24 (25 2-7 weeks), the total receipts were £2,087,144, a decrease of £17,257.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended September 6 gave total receipts of £425,308, or £3,834 less than in the corresponding week of last year. The aggregate receipts for twenty-three weeks amounted to £9,723,964, an increase of £120,959 over the corresponding period of last year.

## CONTRACTS.

**The Egyptian State Railways** have accepted the tender of the Westinghouse Brake & Saxby Signal Co., Ltd., for turnover levers and signalling materials, at a cost of £523.

**Wimbledon Watch Committee** has accepted the tender of Dennis Bros., Ltd., of Guildford, for the supply of a 60-100 h.p. six-cylinder turbine motor fire engine, complete with first-aid tank outfit.

**Buenos Aires Great Southern Railway Co.** has ordered three Diesel mobile electric power plants and a Diesel electric locomotive from Sir W. G. Armstrong Whitworth & Co. (Engineers), Ltd., Newcastle.

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**Cardiff Tramways Committee** has accepted the tender of Russian Oil Products, Ltd., for 750,000 gallons of petrol at 1s. 0⅞d. per gallon. Five companies within the combine quoted 1s. 1d. per gallon, and National Benzole, Ltd., 1s. 3d. per gallon. R.O.P. stated that 95 per cent. of their employees were British.

**Cape Electric Tramways,** which for several years have operated a fleet of Albion omnibuses in the Cape Town district, has placed an order for six more omnibuses with the Albion Motor Co., of Glasgow, for use in connection with the tramways at Port Elizabeth, which are also owned by the Cape Electric Tramways.

**Ayr Corporation** has placed the following contracts :—Tramway tie bars, Hadfields, Ltd., £216 ; tramway rails, Dorman, Long and Co., Ltd., £1,827 ; welding, Murex, Ltd., £432 ; crossovers, Titan Track Work Co., Ltd., £323 ; bogies, J. G. Brill Co., £192 ; magnetic brakes, British Thomson-Houston Co., Ltd., £35 ; permanent way construction, A. Stark & Sons, £9,054.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or − | Wks | Aggregate. 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. | Aug. 19 | 517 | 512 | − 5 | 20 | 11,600 | − 222 |
| „ Motor Buses | „ 19 | 210 | 277 | + 67 | 20 | 5,870 | + 994 |
| „ Total | „ 19 | 727 | 789 | + 62 | 20 | 17,470 | + 772 |
| Aberdeen Corp. | Sept. 17 | 4,831 | 4,890 | + 59 | 15¾ | 88,983 | + 816 |
| Ashton-u-Lyne Corp. | „ 20 | 900 | 836 | − 64 | 25 | 21,340 | − 1,667 |
| „ Motor Buses | „ 20 | 451 | 493 | + 42 | 25 | 12,499 | + 155 |
| „ Trolley Buses | „ 20 | 285 | 261 | − 24 | 25 | 6,503 | − 442 |
| „ Total | „ 20 | 1,636 | 1,590 | − 46 | 25 | 40,342 | − 1,954 |
| Ayr Corporation | „ 20 | 1,321 | 1,195 | − 126 | 18 | 12,979 | − 1,098 |
| Barrow Corporation | „ 13 | 630 | 555 | − 75 | 24 | 14,217 | − 1,137 |
| „ Motor Buses | „ 13 | 478 | 414 | − 64 | 24 | 10,246 | + 689 |
| „ Total | „ 13 | 1,108 | 969 | − 139 | 24 | 24,463 | − 448 |
| Belfast City | „ 19 | 11,342 | 11,937 | + 595 | 24½ | 283,342 | + 8,879 |
| „ Motor Buses | „ 19 | 1,070 | 1,300 | + 230 | 24½ | 31,937 | + 6,616 |
| „ Total | „ 19 | 12,412 | 13,237 | + 825 | 24½ | 315,279 | + 15,495 |
| Birkenhead Corp. | „ 21 | 1,667 | 1,505 | − 162 | 25 | 38,716 | − 4,176 |
| „ Motor Buses | „ 21 | 3,261 | 3,874 | + 613 | 25 | 94,564 | − 876 |
| „ Total | „ 21 | 4,928 | 5,379 | + 451 | 25 | 133,280 | − 5,052 |
| Birmingham Corp. | „ 16 | 27,799 | 25,324 | − 2,475 | 24 | 628,762 | − 21,770 |
| „ Motor Buses | „ 16 | 13,830 | 15,624 | + 1,794 | 24 | 368,867 | + 59,473 |
| „ Trolley Buses | „ 16 | 557 | 519 | − 38 | 24 | 13,001 | − 187 |
| „ Total | „ 16 | 42,186 | 41,467 | − 719 | 24 | 1,010,630 | + 37,516 |
| Blackburn Corp. | „ 17 | 2,208 | 1,876 | − 332 | 24½ | 44,892 | − 4,112 |
| „ Motor Buses | „ 17 | Nil | 342 | + 342 | 24½ | 7,821 | + 7,821 |
| „ Total | „ 17 | 2,208 | 2,218 | + 10 | 24½ | 52,713 | + 3,709 |
| Bradford Corporation | „ 20 | 10,122 | 8,985 | − 1,137 | 25 | 220,937 | − 30,232 |
| „ Motor Buses | „ 20 | 3,249 | 3,042 | − 207 | 25 | 74,940 | − 3,913 |
| „ Trolley Buses | „ 20 | 1,076 | 1,917 | + 841 | 25 | 47,563 | + 21,568 |
| „ Miscellaneous | „ 20 | 317 | 362 | + 45 | 25 | 11,116 | − 133 |
| „ Total | „ 20 | 14,764 | 14,306 | − 458 | 25 | 354,556 | − 12,710 |
| Brighton Corporation | „ 21 | 2,865 | 2,808 | − 57 | 24⅞ | 73,579 | + 1,937 |
| Burnley Corporation | „ 20 | 2,873 | 2,578 | − 295 | .. | ... | ... |
| „ Motor Buses | „ 20 | 610 | 644 | + 34 | ... | ... | ... |
| „ Total | „ 20 | 3,483 | 3,222 | − 261 | ... | ... | ... |
| Burton-on-Trent Corp. | „ 21 | 818 | 905 | + 87 | 25 | 21,199 | + 794 |
| Bury Corporation | „ 21 | 2,022 | 1,684 | − 338 | 24⅞ | 45,021 | − 5,950 |
| „ Motor Buses | „ 21 | 616 | 1,452 | + 836 | 24⅞ | 78,491 | + 17,125 |
| „ Total | „ 21 | 2,638 | 3,136 | + 498 | 24⅞ | 73,512 | + 11,175 |
| Cardiff Corporation | „ 20 | 7,916 | 7,875 | − 41 | 24⅞ | 194,423 | + 1,500 |
| Chatham and District | „ 18 | 1,374 | 1,188 | − 186 | 37 | 43,465 | + 236 |
| Chester Corporation | „ 21 | 430 | Nil | − 430 | 25 | Nil | − 11,169 |
| „ Motor Buses | „ 21 | Nil | 681 | + 681 | 25 | 16,740 | + 16,740 |
| „ Total | „ 21 | 430 | 681 | + 251 | 25 | 16,740 | + 5,571 |
| Chesterfield Corp. | „ 22 | 1,929 | 1,985 | + 56 | 25 | 48,054 | + 1,091 |
| Colchester Corp. | „ 24 | 564 | 614 | + 50 | 26 | 16,019 | + 1,687 |
| Colne Corporation | „ 17 | 700 | 661 | − 39 | 24 | 17,329 | − 372 |
| Coventry Corporation | „ 21 | 2,068 | 1,912 | − 156 | 25 | 49,516 | − 3,577 |
| „ Motor Buses | „ 21 | 1,614 | 1,738 | + 124 | 25 | 44,778 | + 5,455 |
| „ Total | „ 21 | 3,682 | 3,650 | − 32 | 25 | 94,294 | + 1,878 |
| Darlington Corp | „ 20 | 1,004 | 1,047 | + 43 | 24⅝ | 26,374 | + 2,185 |
| Derby Corporation | „ 20 | 2,530 | 2,483 | − 47 | 25 | 61,082 | − 1,876 |
| „ Motor Buses | „ 20 | 785 | 947 | + 162 | 25 | 22,814 | + 4,898 |
| „ Total | „ 20 | 3,315 | 3,430 | + 115 | 25 | 83,896 | + 3,022 |
| Dover Corporation | „ 20 | 452 | 463 | + 11 | 25 | 11,331 | + 343 |
| Dundee Corporation | „ 9 | 2,721 | 2,515 | − 206 | 16½ | 43,020 | − 1,465 |
| „ Motor Buses | „ 9 | 868 | 1,184 | + 316 | 16½ | 18,801 | + 4,689 |
| „ Total | „ 9 | 3,589 | 3,699 | + 110 | 16½ | 61,821 | + 3,224 |
| East Ham Corp. | „ 20 | 2,337 | 2,385 | + 48 | 24½ | 57,045 | + 725 |
| Edinburgh Corp. | „ 13 | 14,136 | 13,315 | − 821 | 17¼ | 263,298 | + 5,360 |
| „ Motor Buses | „ 13 | 3,422 | 3,594 | + 172 | 17¼ | 66,863 | + 5,362 |
| „ Total | „ 13 | 17,558 | 16,909 | − 649 | 17¼ | 330,161 | + 10,722 |
| Exeter Corporation | „ 25 | 905 | 780 | − 125 | 26 | 21,099 | − 1,697 |
| „ Motor Buses | „ 25 | 183 | 414 | + 231 | 26 | 8,330 | + 4,620 |
| „ Total | „ 25 | 1,088 | 1,194 | + 106 | 26 | 29,429 | + 2,923 |
| Glasgow Corporation | „ 13 | 45,789 | 44,091 | − 1,698 | 15 | 642,433 | + 1,028 |
| „ Motor Buses | „ 13 | 6,063 | 9,426 | + 3,363 | 15 | 123,807 | + 47,017 |
| „ Total | „ 13 | 51,852 | 53,517 | + 1,665 | 15 | 766,240 | + 48,045 |
| Gloucester Corp. | „ 17 | 626 | 735 | + 109 | 24½ | 17,463 | + 3,701 |
| Grimsby Corporation | „ 20 | 1,528 | 1,609 | + 81 | 25 | 40,313 | + 4,263 |
| Halifax Corporation | „ 16 | 4,745 | 5,091 | + 346 | 24½ | 125,672 | + 13,886 |
| Huddersfield Corp. | „ 20 | 6,556 | 6,510 | − 46 | 25 | 159,454 | − 2,113 |
| Hull Corporation | „ 20 | 6,006 | 5,719 | − 287 | 25 | 141,381 | − 3,499 |
| „ Motor Buses | „ 20 | 1,365 | 1,753 | + 388 | 25 | 39,202 | + 5,979 |
| „ Total | „ 20 | 7,371 | 7,472 | + 101 | 25 | 180,583 | + 2,480 |
| Ilford Corporation | „ 20 | 1,625 | 1,538 | − 87 | 24½ | 37,463 | + 537 |
| Ipswich Corp. Trol.Bus | „ 20 | 1,334 | 1,412 | + 78 | 24½ | 33,916 | + 1,829 |
| Isle of Thanet | „ 17 | 1,537 | 1,229 | − 308 | 37½ | 34,164 | − 4,061 |
| Kilmarnock Corp. | „ 20 | 494 | 504 | + 10 | 18½ | 9,022 | + 384 |
| Lancashire Un. | „ 14 | 2,260 | 2,083 | − 177 | 30½ | 78,226 | − 4,319 |
| „ Motor Buses | „ 14 | 4,997 | 5,281 | + 284 | 30½ | 182,487 | + 24,282 |
| Leeds Corporation | „ 20 | 20,191 | 19,949 | − 242 | 24½ | 495,072 | + 8,369 |
| Leicester Corp. | „ 20 | 8,733 | 8,793 | + 60 | 25 | 207,572 | + 511 |
| Lincoln Corp. | „ 14 | 966 | 1,002 | + 36 | 24 | 22,768 | + 76 |
| Liverpool Corp. | „ 20 | 27,302 | 28,286 | + 984 | 24½ | 666,584 | − 11,608 |
| „ Motor Buses | „ 20 | 2,937 | 3,463 | + 526 | 24½ | 82,579 | + 12,987 |
| „ Total | „ 20 | 30,239 | 31,749 | + 1,510 | 24½ | 749,163 | + 1,379 |
| London County Coun. | „ 24 | 83,586 | 82,696 | − 890 | 25¼ | 2,087,144 | − 17,257 |
| Luton Corporation | „ 17 | 468 | 449 | − 19 | 24½ | 10,499 | + 264 |
| Maidstone Corp. | „ 18 | 202 | Nil | − 202 | 24½ | Nil | − 5,513 |
| „ Motor Buses | „ 18 | 364 | 303 | − 61 | 24½ | 6,873 | − 481 |
| „ Trolley Buses | „ 18 | 335 | 655 | + 320 | 24½ | 15,091 | + 7,515 |
| „ Total | „ 18 | 901 | 958 | + 57 | 24½ | 21,964 | + 1,521 |
| Manchester Corp. | „ 20 | 35,148 | 32,115 | − 3,033 | 25 | 796,260 | − 72,294 |
| „ Motor Buses | „ 20 | 4,889 | 9,016 | + 4,127 | 25 | 215,124 | + 90,367 |
| „ Total | „ 20 | 40,037 | 41,131 | + 1,094 | 25 | 1,011,384 | + 18,073 |
| Middlesbrough Corp. | „ 16 | 1,161 | 957 | − 204 | 24½ | 25,093 | − 2,501 |
| „ Motor Buses | „ 16 | 591 | 521 | − 70 | 24½ | 13,852 | + 1,157 |
| „ Total | „ 16 | 1,752 | 1,478 | − 274 | 24½ | 38,945 | − 1,344 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or − | Wks | Aggregate 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Tyne Corp. | Sept. 20 | 10,228 | 8,277 | − 1,951 | 24⅞ | 214,870 | − 35,431 |
| „ Motor Buses | „ 20 | 1,989 | 3,435 | + 1,446 | 24⅞ | 78,335 | + 26,934 |
| „ Total | „ 20 | 12,217 | 11,712 | − 505 | 24⅞ | 293,205 | 8,497 |
| Newport Corporation | „ 13 | 1,653 | 1,129 | − 524 | 24 | 36,325 | − 3,678 |
| „ Motor Buses | „ 13 | 776 | 1,311 | + 535 | 24 | 21,411 | + 3,232 |
| „ Total | „ 13 | 2,429 | 2,440 | + 11 | 24 | 57,736 | − 446 |
| Northampton Corp. | „ 19 | 1,146 | 831 | − 315 | 24½ | 26,142 | − 1,355 |
| „ Motor Buses | „ 19 | 739 | 1,097 | + 358 | 24½ | 19,069 | + 2,775 |
| „ Total | „ 19 | 1,885 | 1,928 | + 43 | 24½ | 45,211 | + 1,220 |
| Nottingham Corp. | „ 18 | 6,583 | 5,639 | − 944 | 24⅞ | 140,505 | − 21,903 |
| „ Motor Buses | „ 18 | 2,537 | 3,366 | + 829 | 24⅞ | 81,553 | + 25,638 |
| „ Trolley Buses | „ 18 | 597 | 1,195 | + 598 | 24⅞ | 29,341 | + 14,960 |
| „ Total | „ 18 | 9,717 | 10,200 | + 483 | 24⅞ | 251,399 | + 18,695 |
| Oldham Corporation | „ 20 | 3,665 | 3,409 | − 256 | 26 | 86,637 | − 5,517 |
| „ Motor Buses | „ 20 | 1,953 | 1,960 | + 7 | 26 | 51,691 | − 1,173 |
| „ Total | „ 20 | 5,618 | 5,369 | − 249 | 26 | 138,328 | − 6,690 |
| Plymouth Corp. | „ 20 | 3,824 | 3,560 | − 264 | 24⅞ | 92,685 | − 4,146 |
| „ Motor Buses | „ 20 | 1,987 | 2,516 | + 529 | 24⅞ | 61,710 | + 13,237 |
| „ Total | „ 20 | 5,811 | 6,076 | + 265 | 24⅞ | 154,395 | + 9,091 |
| Portsmouth Corp. | „ 20 | 4,825 | 4,338 | − 487 | 25 | 113,313 | 10,528 |
| „ Motor Buses | „ 20 | 2,114 | 3,224 | + 1,110 | 25 | 87,889 | + 33,863 |
| „ Total | „ 20 | 6,939 | 7,562 | + 623 | 25 | 201,202 | + 24,335 |
| Preston Corporation | „ 17 | 1,752 | 1,704 | − 48 | 24⅞ | 40,746 | − 2,036 |
| „ Motor Buses | „ 17 | 511 | 528 | + 17 | 24⅞ | 12,670 | + 719 |
| „ Total | „ 17 | 2,263 | 2,232 | − 31 | 24⅞ | 53,416 | − 1,317 |
| Rawtenstall Corp. | „ 7 | 864 | 641 | − 223 | 22⅞ | 14,877 | − 4,508 |
| „ Motor Buses | „ 7 | 540 | 683 | + 143 | 22⅞ | 16,080 | + 4,042 |
| „ Total | „ 7 | 1,404 | 1,324 | − 80 | 22⅞ | 30,957 | − 466 |
| Reading Corporation | „ 18 | 1,592 | 1,473 | − 119 | 25 | 35,579 | − 1,763 |
| „ Motor Buses | „ 18 | 947 | 1,025 | + 78 | 25 | 24,916 | + 2,246 |
| „ Total | „ 18 | 2,539 | 2,498 | − 41 | 25 | 60,495 | + 483 |
| Rochdale Corp. | „ 20 | 2,899 | 2,739 | − 160 | ... | 68,523 | − 5,094 |
| „ Motor Buses | „ 20 | 1,578 | 1,565 | − 13 | ... | 38,753 | + 10 |
| „ Total | „ 20 | 4,477 | 4,304 | − 173 | ... | 107,276 | − 5,084 |
| Rotherham Corp. | „ 22 | 3,050 | 3,208 | + 158 | 25 | 69,633 | + 2,023 |
| Salford Corporation | „ 21 | 11,109 | 10,904 | − 205 | 24⅞ | 277,595 | − 261 |
| Sheffield Corp. | „ 20 | 21,207 | 19,904 | − 1,303 | 24½ | 507,548 | − 16,116 |
| Southampton Corp. | „ 17 | 3,668 | 3,584 | − 84 | 25 | 86,568 | + 1,526 |
| „ Motor Buses | „ 17 | 850 | 877 | + 27 | 25 | 21,564 | + 2,518 |
| „ Total | „ 17 | 4,518 | 4,461 | − 57 | 25 | 108,132 | + 4,044 |
| Southend-on-Sea Corp. | „ 24 | 2,235 | 2,224 | − 11 | 25½ | 60,584 | − 3,353 |
| „ Trolley Buses | „ 24 | 280 | 317 | + 37 | 25½ | 8,750 | + 2,925 |
| „ Total | „ 24 | 2,515 | 2,541 | + 26 | 25½ | 69,334 | − 428 |
| Southport Corp. | „ 20 | 1,395 | 1,375 | − 20 | 24½ | 35,089 | − 792 |
| „ Motor Buses | „ 20 | 417 | 435 | + 18 | 24½ | 11,406 | + 978 |
| „ Total | „ 20 | 1,812 | 1,810 | + 2 | 24½ | 46,491 | + 186 |
| St. Helens Corp. | „ 16 | 2,015 | 2,064 | + 49 | 24½ | 49,620 | + 2,612 |
| Sunderland Corp. | „ 23 | 2,400 | 2,155 | − 245 | 25 | 63,624 | + 782 |
| „ Motor Buses | „ 23 | 264 | 728 | + 464 | 25 | 14,783 | + 9,212 |
| „ Total | „ 23 | 2,664 | 2,883 | + 219 | 25 | 78,407 | + 9,994 |
| Swindon Corp. | „ 17 | 895 | 985 | + 90 | 24⅞ | 24,290 | + 4,805 |
| Wallasey Corp. | „ 20 | 1,299 | 1,216 | − 83 | 24½ | 31,842 | − 2,808 |
| „ Motor Buses | „ 20 | 2,189 | 2,396 | + 207 | 24½ | 61,524 | + 5,662 |
| „ Total | „ 20 | 3,488 | 3,612 | + 124 | 24½ | 93,366 | + 2,854 |
| Walsall Corporation | „ 14 | 3,431 | 3,396 | − 35 | 24 | 82,798 | + 957 |
| Walthamstow Corp. | „ 20 | 2,546 | 2,474 | − 72 | 24½ | 61,665 | − 301 |
| Warrington Corp. | „ 18 | 868 | 926 | + 58 | 25 | 22,046 | + 108 |
| „ Motor Buses | „ 18 | 447 | 523 | + 76 | 25 | 16,480 | + 1,423 |
| „ Total | „ 18 | 1,315 | 1,449 | + 134 | 25 | 38,526 | + 1,531 |
| West Ham Corp. | „ 18 | 6,206 | 5,947 | − 259 | 24⅞ | 147,706 | + 507 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses | „ 14 | 2,806 | 2,417 | − 689 | 24 | 59,054 | − 8,837 |
| „ Trolley Buses | „ 14 | 3,313 | 3,256 | − 57 | 24 | 83,470 | + 3,678 |
| „ Total | „ 14 | 6,119 | 5,673 | − 446 | 24 | 142,524 | − 5,159 |
| York Corporation | „ 17 | 1,074 | 980 | − 94 | 25 | 26,197 | − 224 |
| „ Motor Buses | „ 17 | 411 | 529 | + 118 | 25 | 12,677 | + 3,094 |
| „ Trolley Buses | „ 17 | 61 | Nil | − 61 | 25 | Nil | − 1,509 |
| „ Total | „ 17 | 1,546 | 1,509 | − 37 | 25 | 38,874 | + 1,561 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Wks. or *M* | Aggregate. 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Sept. 23 | £84,483 | £77,019 | 38 *w* | £3,114,638 | − £160,269 |
| Brazilian Traction $ | Aug. | 4,333,160 | 3,792,808 | 8 *m* | 32,160,185 | − 546,195 |
| British Columbia $ | July | 1,156,720 | 1,196,239 | 1 *m* | 1,196,239 | + 39,519 |
| Buenos Aires Lacroze | Sept. 21 | 11,599 | 11,175 | 12 *w* | 128,007 | − 10,772 |
| Burma E. Sup. Co. Rs. | Aug. | 61,309 | 66,418 | 12 *m* | 842,707 | − 11,962 |
| Calcutta ... Rs. | Sept. 20 | 131,131 | 113,300 | 37½ *w* | 4,195,914 | − 598,900 |
| Cape Town ... ... | Aug. | 27,636 | 24,690 | ... | ... | .. |
| Cartbagena & Herrerias | Aug. | 1,169 | 505 | 8 *m* | 6,855 | − 1,235 |
| Durban Corporation | July | 20,110 | 27,049 | 12 *m* | 288,972 | − 3,643 |
| East India ... ... | Aug. | 4,152 | 3,948 | 1 *m* | 3,948 | − 204 |
| Kalgoorlie ... ... | June | 1,660 | 1,753 | 6 *m* | 9,886 | + 25 |
| Madras (2 weeks) Rs. | Sept. 15 | 47,384 | 51,229 | 36 *w* | 793,187 | + 41,098 |
| Para ... ... | Aug. | 15,224 | 12,681 | 9 *m* | 131,304 | − 2,022 |
| Port Elizabeth ... | Aug. | 7,402 | 6,955 | ... | ... | ... |
| Rangoon ... Rs. | Aug. | 123,550 | 146,320 | 8 *m* | 1,197,255 | + 242,264 |
| Shanghai ... $ | Aug. | 335,172 | 386,112 | 7 *m* | 2,679,699 | + 49,478 |
| Singapore ... ...$ | Aug. | 130,000 | 142,000 | 11 *m* | 1,510,000 | + 165,000 |
| Winnipeg ... ...$ | July | 497,935 | 452,212 | 7 *m* | 3,725,716 | − 112,297 |

## RAILWAY RECEIPTS.

| 38th Week ended Sept. 21st | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 257,000 | − 17,000 | 328,000 | − 23,000 | 585,000 | − 40,000 | -1,049,000 |
| L.M.S.R. | 547,000 | − 48,000 | 766,000 | − 94,000 | 1,313,000 | − 142,000 | -3,400,000 |
| L.N.E.R. | 379,000 | − 31,000 | 613,000 | − 83,000 | 992,000 | − 114,000 | -2,220,000 |
| S.R. | 340,000 | − 20,000 | 112,000 | − 11,000 | 452,000 | − 31,000 | − 429,000 |
| Totals | 1,523,000 | − 116,000 | 1,819,000 | − 211,000 | 3,342,000 | − 327,000 | -7,107,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or − | Aggregate. 1930. | + or − |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Sept. 20 | 299,300 | 301,000 | + 1,700 | 11,422,400 | + 616,200 |
| Lond. & Sub. Group | „ 20 | 45,500 | 45,300 | − 200 | 1,681,500 | + 98,700 |
| Metropolitan Railway | „ 20 | 36,900 | 36,200 | − 700 | 1,390,000 | + 19,500 |
| Liverpool Overhead | „ 21 | 1,914 | 1,663 | − 251 | 60,343 | − 4,468 |
| Mersey Railway ... | „ 20 | 4,357 | 4,391 | + 34 | 172,047 | + 4,056 |

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LONDON, OCTOBER 4, 1930.

## INTRODUCING THE ROAD TRAFFIC ACT.

The labour involved in bringing into operation the Road Traffic Act is placing a tax on the energy of the Minister of Transport. That burden is increased by the wise step of consulting with all the interests affected before he draws up the regulations which he is empowered to make. Several such conferences have been held, and at one which is fixed for next week matters connected with public vehicles will be considered. Mr. Morrison is to be commended for the comprehensive and lucid exposition of the Act which he gave this week to newspaper representatives. Indeed, his conduct of the whole of the complicated situations which have arisen in connection with the measure during the past twelve months has given general satisfaction. Evidently the Minister believes that Parliament and Government Departments exist to serve the people, not to dragoon them. The eyesight and health declarations which have to be made by an applicant for a driver's licence should prove an advantage not only to the owners of transport undertakings, but to passengers and to pedestrians. Many municipal and company undertakings insist on a medical examination of employees before engaging them, and it is greatly to be desired that all should follow that rule. The laxity of those who do not will to some extent be remedied by the declaration referred to, and as there will be severe penalties for a false statement, the regulation should have the effect of preventing unfit men from applying for positions in which they might be a danger to themselves and to the public. The regulations that all public and private motor vehicles must be insured against third-party risks and that no vehicle licence is to be granted unless the owner can produce a certificate of insurance, are valuable provisions. These requirements will come into force on January 1, and no regret will be felt if they have the effect of depriving careless owners of public and private vehicles of licences. It is to be regretted that some delay is necessary in giving effect to Parts IV and V, which respectively deal with the regulation of public service vehicles and their operation by local authorities. Regulations in Part IV that should add to public safety provide that the Commissioners are not to grant a road service licence unless the applicant can produce an official certificate of the fitness of the vehicle, and that the licence can be suspended if the vehicle becomes defective. The requirement that within a reasonable time heavy vehicles, with a few exceptions, shall be fitted with pneumatic tyres should be advantageous to the owners, the road authority and the owners and occupiers of property; for there is no nuisance so great as a heavy vehicle on solid tyres running at present-day speeds. All newly-registered public vehicles must, of course, have air tyres. By the end of November the Minister hopes that the Traffic Commissioners will have been appointed, but they will not begin to license, regulate and co-ordinate public passenger services until April 1. If Mr. Morrison's anticipations are realised the Commissioners' powers over time-tables will enable them to keep speed down to 30 m.p.h. April 1 is also the date when the municipal omnibus undertakings are to enter into their wider heritage. "Claim jumpers" should note the warnings given by the Minister of Transport that they will not be allowed to benefit in the interval by any new services that they may introduce for which there is no public requirement.

## INTERNATIONAL TRAMWAYS UNION.

### SPECIAL MEETING IN PARIS.

A provisional programme has now been arranged for the special meeting of the "Union Internationale de Tramways, de Chemins de Fer D'Interet Local et de Transports Publics Automobiles" to be held in Paris on Tuesday and Wednesday, October 21 and 22. The object of the meeting is to consider the subject of regenerative control on tramcars and to witness demonstrations that are regarded as of sufficient importance to justify a special meeting of the Union.

The members will meet at the offices of the Paris Transport Co. (Société des Transports en Commun de la Région Parisienne), 55, Quai des Grands Augustins, at 10 a.m. on October 21, when M. Bacqueyrisse, general manager and chief of the technical department of the company, will make a statement upon the results obtained in the use of equipment for the regeneration of energy. Subsequently the members will be entertained at luncheon by the S.T.C.R.P. At 3 p.m. they will meet at the Quai du Louvre to witness trials on the Louvre-Versailles line.

The following day the party will leave the Gare des Invalides at 9.30 a.m. for Versailles, where trials will be witnessed of regenerative control equipment by the Versailles Electric Tramways Company. The members will subsequently be entertained at luncheon at Versailles by the company, and afterwards visit the Palace and the Park of Versailles and the Trianons. At 5 p.m. there will be a discussion at the offices of the S.T.C.R.P.

As mentioned in last week's issue, M. F. de Lancker, president of the Union, when speaking at the conference of the Municipal Tramways Association at Harrogate, invited tramway managers in this country to attend the meeting. Arrangements are being made by Mr. J. Beckett, general secretary of the Municipal Tramways and Transport Association, who will arrange for an official invitation to be sent to managers who apply to him not later than October 6.

Mr. R. S. Pilcher, general manager of the Manchester Corporation Tramways, intends to provide transport by omnibus which will run from Manchester to Dover and Calais to Paris. The omnibus will leave 55, Piccadilly, Manchester, on October 16, and the Waldorf Hotel, London, on October 17, and the party will return from Paris on Wednesday, October 22. Mr. R. S. Pilcher, the new president of the Municipal Tramways and Transport Association, and Mr. J. Beckett will attend the meeting as official representatives of the Association.

**Darlington Trolleybus Extension.**—Darlington Transport Committee recommends the Town Council to apply for a Provisional Order for the extension of the trolleybus routes to the new boundaries.

**Motor Car Design and Safety Glass.**—A conference between the Minister of Transport and representatives of manufacturers and users of motor cars was held at the Ministry of Transport on Tuesday. The meeting was preliminary to the making by the Ministry of an order under the Road Traffic Act co-ordinating the various regulations in regard to motor car design. Among the subjects discussed were the use of mirrors on cars, the increased use of unsplinterable glass for wind-screens and the prevention of unnecessary noise. The conference did not, it is understood, reach the stage at which any definite recommendation could be made to the Minister, and the meeting was adjourned until October 6, when matters relating to public service vehicles in particular will be considered.

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## LONDON PASSENGER TRANSPORT.

THE GOVERNMENT'S SCHEME FOR UNIFICATION UNDER PUBLIC CONTROL.

The Minister of Transport (Mr. Herbert Morrison) announces that on Wednesday and Thursday he met in successive conferences representatives of the various bodies concerned with the provision of passenger transport in and around London. He was accompanied by the Parliamentary Secretary to the Ministry (Lord Ponsonby), and the bodies represented were the local authorities owning tramways in the London Traffic Area, namely, London County Council, Middlesex and Hertfordshire County Councils, the County Boroughs of Croydon, East Ham and West Ham, and the Barking, Bexley, Dartford, Erith, Ilford, Leyton and Walthamstow Councils, the Underground Group of Railway, Tramway and Omnibus Companies, the Metropolitan Railway, the Association of London Omnibus Proprietors, Thomas Tilling, Ltd., Tillings and British Automobile Traction Co., and the four amalgamated Railway Companies.

Mr. Morrison thanked the authorities and the companies for the assistance which in general they had given to Sir William McLintock in the financial inquiries which he had been conducting on behalf of the Government, and explained that while these inquiries were not yet in all respects complete, the Government proposed to proceed at once with the object of introducing legislation, and to open discussions at a very early date. In view of the admitted urgency of the matter it was desirable that there should be no avoidable delay.

PROPOSED NEW STATUTORY PUBLIC BODY.

Mr. Morrison said that he had always felt that there was an urgent need for a wide measure of co-ordination of the undertakings engaged in passenger transport in the London area. Recognition of this need had not been confined to any one political party or to any one group of interests concerned in London transport. It had been recommended in varying forms by successive Commissions and Committees who had considered the question of transport in London, culminating in the Report of the London and Home Counties Traffic Committee issued in 1927 and widely known as the "Blue Report." Where there had been some differences of opinion was as to the measures to be adopted to bring about the desired end. In other words, there had been a general unity of opinion as to the end to be achieved, but considerable diversity as to the means.

When he came into office this subject formed one of his first preoccupations. Mr. Morrison recalled the announcement which he made in Parliament on December 2, 1929. In that statement the Government had outlined its policy as follows :—

(1) That uneconomic and unnecessary competition must be eliminated.
(2) That the objects in view could best be achieved by securing unification under public control of passenger transport by omnibus, tramway or local railway in the London Traffic Area. A single and simple form of public ownership should, therefore, be substituted for the complicated network of separate private and municipal interests now existing.
(3) The principle of public ownership should be combined with the principle of commercial management, thus ensuring the advantages of vigorous business enterprise.

The Government believed that by this means London passenger transport as a whole could be made a sound business proposition, ensuring a safe and reasonable return to the capital invested in it, by the elimination of waste and a steady and progressive development of the facilities required in the public interest.

The Government accordingly proposed to create a new statutory public body, which would embrace :—

The railway, omnibus and tramway undertakings controlled by the Underground Electric Railway Company of London Limited ;

The Metropolitan Railway ;

The tramway undertakings owned by local authorities within the London area ; and

Other omnibus undertakings operating within the London area.

This new body would be charged with the future management, operation and maintenance of one consolidated undertaking, and with the duty of making provision for further facilities as and when required.

It was not to be assumed that the above list of undertakings was necessarily exhaustive. There might be other undertakings allied to those mentioned which for various reasons it might be deemed necessary or expedient to acquire.

SUBURBAN RAILWAYS EXCLUDED.

Dealing with the position of the suburban lines of the amalgamated railway companies, the Minister said that in view of the fact that they are inextricably bound up with the main lines there would be great difficulties in bringing these lines into any scheme of unified ownership, and that the Government did not contemplate that the existing ownerships should in this case be disturbed. Arrangements should, however, be made which, while having proper regard to the public interest, would be fair to the amalgamated companies and would enable the suburban lines, which played an important part in carrying London's passengers, to discharge their proper function in a fully correlated scheme of transport.

In proposing the transfer of these public transport services to public ownership under a body of the nature mentioned the Government was not taking a leap in the dark. Already Parliament had recognised the necessity in many cases of entrusting essential national or local services to public bodies of this nature, such as the Port of London Authority, Metropolitan Water Board, and the Central Electricity Board.

Proceeding to deal with certain leading aspects of his proposals, the Minister said that he had given very careful consideration to the nature of the Traffic Authority. He started with a bias in favour of a joint municipal body representative of the local authorities in the area, but in the end he came to the conclusion that for this particular task it would not be the appropriate type of authority. He had himself served on a number of indirectly elected *ad hoc* bodies functioning in Greater London. They had done very good work, but he did not regard them as a fully satisfactory instrument of local administration, and much less could he regard such a body as being suitable for conducting a huge business enterprise requiring day-to-day decisions on matters such as would confront the proposed combination of transport undertakings. It would be difficult for leading members of the local authorities to find time to serve on a new joint municipal body if it were established, and its numbers would inevitably make it unwieldy. Further, his own experience of joint authorities was that there was too much "joint" and not enough "authority" about them. If there had been a directly elected municipal body covering a wide area already in existence, the situation might have been different.

The Government, of course, recognised that the cons itution of the Board was a matter of the greatest importance. While they had not come to final conclusions as to its precise composition, they aimed at combining businesslike management with public ownership by the creation of a small board consisting of persons of proved business capacity. Every effort would be made to secure the services of a chairman who would combine business acumen and vigour with wide knowledge and experience, and who could be trusted to ensure that the appointment of officers of the Board would be governed by considerations of efficiency.

THE CONFIDENCE OF INVESTORS AND PASSENGERS.

The Government intended that the Board would be such as would command the confidence both of the investing public and of the users of transport in London, and that proper contact should be maintained between the Board and public opinion. Such a Board should function as freely as possible from political interference so far as questions of management were concerned.

Provision would be made in the Bill for securing fair and proper treatment for officers and employees of the undertakings to be taken over. He was anxious to utilise the experience and abilities which existed in the present undertakings.

Mr. Morrison said that it would be undesirable in advance of the discussions, to lay down definitely the sphere of operation of the Traffic Board. It was, however, fairly obvious that all passenger services by road which served London and its immediate surroundings must be concentrated in the hands of the Board. At the same time regard should be had to the provision of through facilities where public convenience so demanded, and it might, therefore, be undesirable to define too rigidly the area over which the Board might operate, or to limit their activities entirely to the area, whatever it might be, for which they would be responsible.

Long distance road services between London and provincial centres would require to be considered in relation to the functions and powers of the new Board only in so far as they might compete with the services to be provided by the Board by picking up and setting down passengers within a prescribed distance of London.

The new authority would have no interest in extending particular forms of transport. It would have no tramway, tube or omnibus bias. Its transport policy would be determined by technical facts and the public interest. It would be able, as no present undertaking could, to look at London passenger transport as a whole. Any attempt to solve the problem on the basis of a private monopoly would involve setting up an elaborate superstructure of official regulation, check and control.

The Minister invited the various parties to appoint representatives to continue discussions in detail.

## LIVERPOOL FARE EXPERIMENTS.

Liverpool Corporation started an experiment in May by revising most of the omnibus services and increasing the fares. For the eleven weeks to August 16 the passengers numbered 2,519,685, a decrease compared with the eleven weeks to May 17 of 1,113,847, and a decrease in receipts per mile from 11.54d. to 10.98d. There was a decrease in mileage from 535,169 to 403,557, which resulted in a saving of £15,175. The loss on the routes affected is at the rate of £64,500 per annum, and on the whole of the omnibus services £81,100. The effect of placing the fares on an economic basis was that passengers used the cheaper tramcars where they were available ; and only at peak loading times, and then only one way, were the omnibuses on the competitive routes largely patronised, so that receipts did not cover operating costs.

On many routes the operation of omnibus services is not an economic proposition, and it is concluded that omnibuses cannot be successful in competition with tramways if the omnibus fares are materially higher. It is now proposed, as an experiment, to withdraw the tramcars from certain routes and to substitute omnibuses. This, it is suggested, will test the comparative advantages of the two classes of vehicles and show if omnibuses can be operated to serve industrial areas as successfully and efficiently as tramcars.

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## THE ROAD TRAFFIC ACT.

EXPLANATORY STATEMENT BY THE MINISTER OF TRANSPORT.

At a conference with Press representatives on Wednesday, the Minister of Transport, Mr. H. Morrison, announced the dates when it is hoped to bring into operation the five Parts of the Road Traffic Act. So much preliminary work, he said, had had to be done in connection with Part I, which deals with the regulation of motor vehicles, that it could not be brought into force before December 1. The Order relating to the construction and use of motor vehicles, which has to be issued by the Minister under this Part of the Act, would supersede forty existing regulations, and the views of all interested parties had to be sought. Part II, providing for compulsory insurance against third-party risks, should be in operation by January 1, the discussions with the insurance companies having made good progress. It was hoped that Part III, which amends the highway law and includes the new Highway Code, would also come into operation on January 1. Part IV dealt with the regulation of public service vehicles. It could not become operative until April 1. Part V would enable municipalities to run omnibuses without applying to Parliament as was hitherto necessary, and it would also become operative on April 1.

Up to that day, 2,000 applications had been received for the posts of chairmen of the Traffic Commissioners in the twelve areas to be formed. He would make the appointments solely on the merits of the applicants, and their capacity to undertake the work. The two colleagues of the chairman in each area would be selected by the Ministry of Transport from a panel set up by the local authorities. It would be their duty to see that a co-ordinated efficient service of public vehicles was provided. Owners of these vehicles would have to deposit time-tables, and experience would soon teach them what speeds would be necessary in order to fit in with those tables. The speeds of some public vehicles at present were undoubtedly excessive, having regard to their weight and size. Every encouragement would be given to fit in the road services with railway services, in order that there should be a co-ordinated network of transport all over the country.

Extremely defective eyesight and liability to disabling fits would be an absolute bar to a person obtaining a driver's licence. It was clear that persons suffering under these two disabilities would be a danger, and it was probable that they would be entirely excluded from obtaining a driver's licence. The actual standard as to disability was under discussion with members of the British Medical Association. A scientific eyesight test would be laid down in the regulations. It would possibly contain a provision that the applicant must be able to see a car number-plate and should be able to read it in ordinary daylight, with glasses, if worn, at something in the region of 30 to 35 yards. There would also be an indication of other forms of physical and mental diseases which might prevent a person from obtaining a driver's licence. If it were subsequently found that a driver was suffering from something he ought to have declared, he would be liable to severe penalties.

One object aimed at in the regulations dealing with the construction of motor vehicles was the elimination of steel tyres, except where a large load which could not be divided had to be carried on specially constructed trailers. Subject to a few possible exceptions, it was hoped that all motor cars and heavy vehicles would be fitted with pneumatic tyres. Newly-registered public service vehicles would have to be fitted with pneumatic tyres. At an early date all lorries and vans would have to be equipped with sideguard rails between the wheels. A proposal was being explored as to whether in the near future windscreens and any other glass on the front of motor vehicles should be unsplinterable.

## UNNECESSARY MOTOR COACH SERVICES.

TRANSPORT MINISTER'S WARNING.

When speaking at the annual dinner of the Municipal Tramways and Transport Association at Harrogate last week, the Minister of Transport, Mr. Herbert Morrison, warned owners who were "jumping claims" by starting omnibus services before the Road Traffic Act came into effect, that they were doing so at their own risk, and must take the consequences when the Act came into force. A few days later, Mr. Morrison announced that many of the new omnibus and coach services which had been started during the last few months did not appear to meet any obvious public need. He pointed out that some local authorities might be issuing licences to ply for hire in a somewhat wholesale manner, on the assumption that, as their functions as licensing authorities would shortly come to an end, exercise of further control on their part was unnecessary.

He added that in his speech on the third reading of the Bill in the House of Commons on July 23 he asked local authorities who are licensing authorities to exercise their powers with care and responsibility right up to the time when the Provisions of Part IV of the Act came into force. The Ministry has felt it necessary to repeat the warning which he gave, namely, that the Traffic Commissioners would not be bound by the action of licensing authorities or of operators of public vehicles in the past.

Although figures are not available, it is well known that the extension of services was very marked in the latter part of the summer. As a result, the competition for traffic on many routes has become acute. For instance, return fares from Monday to Friday between London and Brighton have been cut to 4s. or 5s., according to the starting point. On other routes very low fares are now quoted for journeys to many parts of the South and West of England, while in the Midlands and the North there is severe congestion on some of the routes where motor coach traffic is heavy.

## LONDON UNITED TRAMWAYS' NEW TROLLEY OMNIBUSES.

A preliminary demonstration of the new trolleybus system to be employed by the London United Tramways Co. was given at their Fulwell Depot on Wednesday last. The company has powers for the conversion of some 20 miles of its undertaking to this type of traction, but so far only a small portion of the overhead work has been completed, and the demonstration was only a short trial run to show the advantages of the vehicle.

Apart from a few minor alterations in design it is similar to the fleet of 36 which the Associated Equipment Co. and the English Electric Co. are supplying in collaboration to the L.U.T. The chassis is the standard A.E.C. six-wheeler omnibus with which Londoners are already familiar, the lower saloon seating 27 passengers—16 in pairs facing forwards and eleven at the rear facing inwards. The upper saloon seats 33 facing forwards in pairs, except for the rear seat which accommodates three. The staircase is enclosed and easy of ascent.

The electrical equipment is manufactured by the English Electric Co. An 80-h.p. motor mounted in front in place of the usual petrol engine supplies the motive power. Semi-automatic control is given by a foot pedal similar to an accelerator, which has three notches of independent control, after which acceleration becomes automatic. Depression of the brake pedal induces first of all rheostatic braking, followed by vacuum servo operation, on all six wheels, while as an emergency measure full depression brings about normal mechanical braking. There is also a hand brake.

The short trial run showed the characteristic advantages of the present-day trolleybus—simplicity and ease of control, flexibility and silent running. The whine of the trolley wheels usually associated with these vehicles has been greatly diminished by the insulation of the trolley arm framework with rubber packing.

Subsequently, Mr. C. J. Spencer, the general manager, explained that the company had thought that since the omnibus in question was available in London it was a suitable opportunity to demonstrate it. Railless trolley cars were not by any means new; he himself had installed some in Bradford in 1911. They offered certain advantages over omnibuses and tramcars, and in this instance the company thought them best suited for the area in which they were to be employed. The trolleybus consumed electricity which was a home-produced source of energy. It did not follow, however, that they would entirely supplant the tramways. The company was aiming at giving the districts concerned the best possible service from all points of view and only time would show how that object would develop.

## PERSONAL.

**Councillor W. E. Turner,** chairman of Bury Corporation Tramways Committee, and vice-chairman of the Lancashire and Cheshire Association of Municipal Tramways, is to be the next Mayor of Bury. He is a retired railway official.

**Mr. J. Smith Green,** a driver in the employ of the London General Omnibus Co., has been presented with a silver wrist watch by the St. John's Wood Division, Metropolitan Police, in acknowledgment of assistance rendered to a constable against a hostile crowd.

**Coventry Chain Company.**—Mr. Arthur Brampton, chairman, and Mr. F. W. Fell Clark and Mr. Norman Hill have resigned from the Board of the Coventry Chain Company. Mr. Charles W. Goff has been appointed chairman, and he has also been elected a director of Hans Renold, Ltd. Mr. Charles G. Renold, chairman of Hans Renold, Ltd., has been appointed a director of the Coventry Chain Company.

**Alderman Arthur Rudd, J.P.,** who has been selected by the Town Council to be the next Mayor of St. Helens, is the principal of Messrs. A. Rudd & Co., cycle dealers. Mr. Rudd entered the Council in 1902 and has been an alderman for seven years, and is chairman of the Tramways Committee. As chairman of the Tramways Committee his special work has been the reorganisation of the transport arrangements.

## BUSINESS NOTES.

**Metropolitan-Vickers Electrical Co., Ltd.**—The address of the Bristol office of this company has been changed to 22, Victoria-street, Bristol. (Telephone No. 6860-1. Telegraphic address: Multiphase, Bristol). The "Cosmos" lamp depot will be at the same address.

**The Peckham Truck & Engineering Co., Ltd.**—It is announced in the "Patent Official Journal" that an extension of patents controlling the "Peckham pendulum suspension" for tramway and railway trucks has been granted to the Peckham Truck & Engineering Co., Ltd., of 504, Stafford House, Norfolk-street, Strand, London, W.C.2, for a further three years.

**Super-Tools, Ltd.,** 137, Victoria-street, London, S.W., with whom is associated the Tool Steel Gearing and Equipment Co., Ltd., are specialising in tools and equipments particularly applicable to omnibus maintenance. An extensive range is available and immediate delivery can be given. The specialities include patent detachable files, lifting jacks of various types, tyre changers for rims of all kinds, capable of dealing with tyres up to 9 ins., cylinder grinders, valve re-seaters, crankshaft truers, etc. Attention is particularly drawn to the valve lifters and spring compressors, which are claimed to be capable of dealing with all types of valves and springs.

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## MISCELLANEOUS NEWS AND NOTES.

**End of Summer Time.**—Summer time will end at 2 a.m. (summer time) on Sunday, October 5. Clocks should be put back one hour.

**Birkenhead Corporation** propose to erect a car shed and an omnibus garage at New Ferry.

**Casablanca Tramways Co.,** Morocco, has decided to convert two tramway routes for trolleybus traction.

**York Tramways Committee** has obtained sanction to borrow £7,674 for the purchase of six omnibuses.

**Scholars' Tickets at Croydon.**—The age limit for scholars' cheap tickets on Croydon tramcars is to be raised to 18.

**Wallasey and Trolleybuses.**—The Wallasey Corporation Tramways Committee is considering the introduction of trolleybuses.

**Salford Tramways Committee** proposes to reconstruct certain lengths of tramway track at an estimated cost of £27,300.

**Montreal Tramways Co.** has submitted to the City Council a plan for the construction of north-south and east-west underground railways.

**Croydon Tramways Committee** has obtained sanction to borrow £3,500 for the construction of a short length of double tramway track in High-street.

**Leeds Tramways Committee** has decided to adopt a system for the issuing of tickets enabling passengers to transfer from tramcars to 'buses and vice versa.

**Merthyr Corporation** has authorised the borough engineer to prepare plans for the erection of additional garage accommodation for the omnibus department.

**Leeds Tramways Committee** has obtained sanction to borrow £200,000 for new tramway cars. The order for these cars had already been placed provisionally.

**Yarmouth-Gorleston Substitution.**—The last tramcars on the route between Yarmouth Bridge and Gorleston ran on September 25, and on the following day omnibuses were substituted.

**South Staffordshire Tramways Co., Ltd.**—A meeting of the members of this company has been called for October 23 at 88, Kingsway, London, to consider a resolution that the company be wound up voluntarily.

**A Dublin Track Alteration.**—Work has begun in removing the double set of tramway lines across O'Connell Bridge, Dublin. They will be replaced by single track, laid within three feet of the island on each side, to facilitate the flow of traffic.

**Lectures on Road Transport.**—A series of lectures on "Modern Road Transport" and "Economics of Road Transport" are to be given by Mr. H. Scott Hall, M.I.A.E., at the North-Western Polytechnic, Kentish Town, during the current season.

**Lower Fares Wanted at Southend.**—Ratepayers at Southend have asked the Town Council to introduce more penny fare stages on the tramways, and to allow children to travel at half rate. A report on the matter is being prepared by the general manager.

**Bolton Tramways Committee** has informed a deputation from the local branch of the Transport and General Workers' Union that they are not at the present time prepared to establish a school for the purpose of training tramwaymen as omnibus drivers.

**Proposed Omnibus Manager at Liverpool.**—A motion which is to come before Liverpool Tramways Committee proposes the appointment of a permanent omnibus manager to assist in the planning, operating and future developments of the omnibus services.

**First-Aid Certificates.**—Mr. H. H. Lancaster, traffic superintendent of Leeds City Tramways, presented 22 St. John Ambulance certificates to members of the Leeds Tramway Division of the Corps. In the past four years 132 men in the department have qualified.

**Co-operation of 'Bus Owners and Tramways Committee.**—Councillor O. H. Cockrill, of Southend, states regarding a suggestion that a joint committee should be formed of the omnibus companies and the Tramways Committtee that discussions have already taken place.

**Edinburgh and Universal Fare.**—Councillor W. J. McLaren has tabled a motion for the consideration of the Edinburgh Corporation Transport Committee suggesting a universal fare on tramcars and omnibuses of 1½d., three tickets being issued for 4d. A single ticket would cost 1½d.

**By Tramcar to Fields and Baths.**—Leeds Education Committee has accepted an offer by the Tramways Department to introduce a system of vouchers whereby classes of scholars would be conveyed to playing fields and swimming baths at a cost of a halfpenny per passenger per journey.

**Manchester Tramways Committee** states that an agreement has been arranged with the Altrincham Council satisfactorily to both parties for the abandonment of the Altrincham tramway route. The Committee has obtained sanction to borrow £39,200 for the purchase of motor omnibuses.

**International Transport Workers.**—The bi-annual congress of the International Transport Workers' Federation was concluded on September 27 at Caxton Hall, Westminster. Mr. C. T. Cramp and Mr. E. Bevan were re-elected to the General Council as members for Great Britain, Ireland and Canada, with Mr. J. E. Walkden and Mr. J. Henson as deputy members.

**New "Underground" Training School.**—Yesterday (Friday) afternoon there was a Press inspection of a new school which the London Underground Railways have established at Lambeth North Station, Westminster Bridge-road, for the training of the railway operating staff. Mr. J. P. Thomas, chief engineer of the companies, gave an interesting explanation of the facilities provided at the school, in which the pupil may acquire knowledge which will assist him in qualifying for the highest position in the service.

**Workmen's Fares Concession at Leeds.**—Workmen's tickets on Leeds tramways are now available for return at any time on the day of issue instead of only after noon.

**Traffic Signals at Bristol.**—Bristol Watch Committee has decided to install additional automatic traffic signals at a cost of £2,650. The cost of maintenance is estimated at £360 per annum, but the signals will release for other duties eleven constables, whose annual pay and allowances amount to £2,600.

**British Omnibus Concession for Cairo.**—The Overseas Motor Transport Co., Ltd., of Victoria-street, London, have secured a concession to operate omnibuses in Cairo. The vehicles, which will be of the latest type, will be supplied by John I. Thornycroft and Co., Ltd., of Smith-square, London.

**Aberdeen Tramway Workers' Wages.**—The fitters and turners employed in the tramways department of Aberdeen Corporation have applied for an increase in wages from £2 19s. 9d. per week to £3 10s. The Committee has decided to review the scale in the other departments before making a decision.

**Preston and Trolleybuses.**—Preston Town Council has approved the recommendation for the promotion in the next session of Parliament of a Bill to provide further powers in connection with their tramway undertaking, including the running of trolleybuses and the securing of borrowing powers of £28,000.

**Proposed Coach Service for Morecambe.**—I. J. Curwen & Sons, Ltd., of Lancaster, have applied to Morecambe Watch Committee for coach licences and state that they have purchased land for the erection of a garage in the borough. The Committee decided to consider the application when the garage is constructed.

**New Trolleybus at Bloemfontein.**—The Karrier-Clough six-wheel double-deck 60-seat trolley omnibus that Messrs. Clough, Smith and Co., Ltd., recently supplied to the Bloemfontein Municipality, has now been delivered and put into service. This is the first of this type of vehicle purchased by any municipality in South Africa.

**New Omnibus Regulations in the Potteries.**—On October 1 new omnibus regulations came into force in the Potteries, whereby no promiscuous stopping places are allowed within a radius of 500 yards of the centre of each of the six Pottery towns. Omnibuses will be permitted to pick up and set down only at specified points within these areas.

**Bournemouth and Trolleybuses.**—The Mayor of Bournemouth, Councillor P. M. Bright, speaking at the annual dinner of the Fire Brigade, said the time was rapidly approaching when they would have to find some substitute for the tramways. He had visited Wolverhampton and gone closely into the question of trolleybuses, and he was convinced that this was the quietest form of traffic they could have.

**Royal Commission on Transport.**—A London newspaper recently stated that the third report of the Royal Commission on Transport would recommend the substitution of trolleybuses for tramways. The following day the report was denied by Sir William Lobjoit, a member of the Commission. Such a proposal, it is understood, was considered by the Commission, but was regarded as impracticable.

**Increased Omnibus Service at Gloucester.**—The Gloucester Transport Committtee has decided to continue the Sunday services on all omnibus routes, to increase the services between King's-square and Elmbridge-road from 30 minutes to 15 minutes, and to provide omnibuses to and from Barton Fair Ground, the deputy-mayor and Councillors Colborn and Elias being empowered to obtain the necessary omnibuses.

**Irish Road Traffic Bills.**—It is expected that the Road Traffic Bill for the regulation of transport between the provincial parts of the Irish Free State will be considered by the Dail early in the approaching session. Another Bill for the control of traffic in Dublin and the competition arising therefrom will also be laid before the Dail. The Ministry has already received a report from the Commission which sat at the time of the Dublin tramway strike.

**Cork City Tramways.**—It is reported that the directors of the Cork City Tramways are considering the substitution of omnibuses for the tramways and are about to enter into negotiations with the Corporation in order to arrange for an "all-in" passenger service. Originally the company supplied electricity to the city, but it now purchases current from the Electricity Supply Board, which took over the power station and the company's contracts for the general supply of energy.

**L.G.O.C. Men Reinstated.**—By an arrangement with the Transport and General Workers' Union, the London General Omnibus Co. has been able to reinstate the 250 men who had become surplus owing to the introduction of the winter services. The Union consented to a 40-hour guaranteed week of five days, instead of the 48-hour guaranteed week previously in operation. This does not necessarily mean that none of the men will have more than a 40-hour week, as the hours depend on changes in the services and on public demands.

**Omnibuses Substituted at Chatham.**—The tramway services operated by Chatham and District Traction Co. were withdrawn on September 30 and omnibuses substituted on October 1. The name of the company has been changed to Medway Traction Co., and the engineer and general manager, Mr. A. J. Bousfield, continues in the same position. The omnibuses are 48-seat double-deck Leyland, with seats upholstered in moquette and equipped with ash-trays, sanitary hand grips and rails, heating controlled by the driver, and a low loading platform. Application has been made for licences for 51 omnibuses, the vehicles serving Chatham, Gillingham and Rochester.

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**The Institution of Automobile Engineers'** winter session will open on Tuesday, October 7, at the Royal Society of Arts, London, at 8 p.m., when Sir Herbert Austin, the new President, will deliver his address entitled "The Future Trend of Automobile Design." At the conclusion questions will be invited on matters dealt with in the address. The address will also be delivered at provincial centres on the subsequent dates. Visitors' tickets for any of the meetings should be obtained from the Secretary, the Institution of Automobile Engineers, Watergate House, Adelphi, London, W.C.2.

**Stations Closed for Economy.**—Ninety railway stations were closed for passenger traffic at the end of September. This will bring the total number of stations closed this year on the four big railways to 176. The figures are as follow: L.N.E.R. 88, L.M.S. 60, G.W.R. 24 and S.R. four. Many of the stations are on small branch lines and others merely halts. In almost all cases motor omnibus services are being run either by the railways or by companies with whom they have agreements. The principal object in closing the stations is to effect economies which are necessary owing to the greatly decreased traffic.

**Bradford Tramways Management.**—Bradford Tramways Committee has decided to advertise for applications for appointment as general manager of the tramways department at a salary of £1,250 a year, rising to £1,750. The salary of Mr. R. H. Wilkinson, who is about to retire, has been £1,100 per year. Mr. C. J. Spencer has visited Bradford and has conferred with the Reorganisation Committee. It is understood that he has not made any definite proposals, but as the Committee's expert advisor he will prepare a report embodying his suggestions and these will be submitted later to the Committee.

**Transfer of Black Country Tramways.**—At midnight on September 30 Walsall Corporation Tramways Department took over the Walsall-Wednesbury-Darlington tramways previously operated jointly with the S. Staffs. Tramway Co. Penny fares were immediately introduced and other reductions in fares were made. Between 40 and 50 men of the S. Staffs. Co. have been taken on by Walsall Corporation. The lines in question will be abandoned as soon as possible in favour of double-deck omnibuses, sixteen of which are on order and are expected to be delivered in the course of three or four months.

**Birmingham First-Aid Competition.**—As the result of a challenge from Birmingham Tramways Department to Nottingham Tramways Department, four teams from each undertaking have met in a first-aid competition. Birmingham No. 1 team were the winners, and received gold medals offered by Mr. A. B. Gibson, assistant commissioner of the Nottingham area of the St. John Ambulance Association. They scored 340 points, the next highest total being 335 by the Forward Depot, Nottingham. It is hoped to hold the contest annually with teams from Nottingham, Leicester, Sheffield, Derby, and other places.

**Brakes of East Ham Cars.**—East Ham Tramways Committee, having investigated a complaint that the brakes on the tramcars were unsatisfactory, is of the opinion that the allegations have not been proved, and recommends that the report of the consulting engineers upon the equipment of the bogie cars be accepted. The engineers, in concluding their report, say that they desire to reassure the Committee by stating that in their opinion there is no cause whatever for apprehension regarding the braking equipment. If used with the same care as is required in driving, the brakes form one of the most satisfactory and universally adopted types of control in use at the present time. The engineers further say that they are satisfied with the system of inspection and the carrying out of day-to-day adjustments as adopted, and the tramways are both adequate and efficient.

## FINANCIAL.

**Fife Tramway, Light and Power Co.**—The reduction of capital from £1,000,000 to £500,000 by the return of preference shares has been confirmed by the Court, and the shares affected were repaid and cancelled as at September 30.

**The General Electric Co.** announced on Tuesday that cash applications for the recent issue of 3,500,000 5 per cent. debentures amounted to nearly six million. Preference on allotment was given both to shareholders' applications and all small applications.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended October 1 amounted to £84,643, a decrease of £1,326 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to October 1 (26 2-7 weeks) the total receipts were £2,172,187, a decrease of £18,637.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended September 13 gave total receipts of £417,879, or £8,864 less than in the corresponding week of last year. The aggregate receipts for twenty-four weeks amounted to £10,141,406, an increase of £111,578 over the corresponding period of last year.

**Nottingham Corporation Transport** report for the past financial year shows total receipts of £508,740, compared with £480,968 in 1928-9; and working expenses £413,588, against £377,900. Income tax was £12,593, interest £18,529, redemption of debt absorbed £38,212, and £27,182 goes to reserve and renewals fund. Passengers numbered 62,907,392 on the tramcars, 6,458,507 on the trolleybuses, and 17,979,066 on the omnibuses, the total making an increase of 3,332,661.

**Ilford Corporation Tramways.**—In his report for the year ended March 31, 1930, Mr. L. E. Harvey, general manager and engineer, Ilford Corporation Tramways, states that the year has been specially noteworthy in view of some of the remarkable records established. Passengers numbered 16,395,883, a record by 514,930. The total revenue amounted to £82,244, a record by £1,441, while the gross surplus at £24,234 exceeded the surplus in any previous year by £2,524. There was a net surplus of £8,840, which was £166 greater than for any previous year. Traffic revenue per mile at 16.710d. shows an increase of .119d., and the total working expenses at 12.339d. per mile a decrease of .390d. During the year a fresh agreement was arranged with the Barking U.D.C. providing for the lease of their line for a further twenty years. The track is being reconstructed at a cost of £20,800. This will entail an increased loan to cover charges amounting to about £1,600 per annum, and as payments of the existing sinking fund and interest charges on the original track must be continued until they expire in September, 1936, the net surplus for some years to come will be adversely affected. During the year the sum of £1,786 was paid to the rates, and during the last few years the department has almost completed the repaving of the tracks on the main routes to the extent of 57,644 square yards, or 12 acres of paving. If the tramways were not in existence the cost of this work would fall upon the rates. Under the recent decision of the Council, the undertaking will have to pay in future about £300 per annum for the scavenging and cleansing of these 12 acres of streets which the tramways do not foul, and for which it might be expected that the cost would be borne by the large sum the tramways pay in rates.

## CONTRACTS.

**Hadfields, Ltd.,** are supplying a cross-over to Croydon Tramways Committee.

**Croydon Education Committee** has purchased two omnibuses from Leyland Motors, Ltd.

**Leicester Tramways Committee** has accepted the tender of Hadfields, Ltd., for special trackwork.

**Leeds Tramways Committee** has accepted the tender of the British Insulated Cables, Ltd., for the supply of three miles of trolley wire at 9½d. per lb.

**Ransomes, Sims & Jefferies, Ltd.,** have an order from the City Omnibus Co., Ltd., Kentish Town, for five 62-seat double-deck top-covered omnibus bodies.

**Mather & Platt, Ltd.,** of Manchester, have an order from Derby Corporation for the installation of the Grinnell sprinkler system for fire extinction at the omnibus garage.

**Manchester Tramways Committee** has accepted the tender of J. H. Billings & Co., of Manchester, for the extension of garage accommodation at the Claremont-road depot, Rusholme.

**Ilford Tramways Committee** has adopted the recommendation of Mr. L. E. Harvey, the engineer and general manager, to obtain quotations for a petrol-driven motor wagon and an electric battery wagon.

**Omnibuses for Southport.**—The fourteen double-deck omnibuses that Southport Corporation Tramways Committee is purchasing at a cost of over £20,000 will be obtained from the Vulcan Motor and Engineering Co. (1906), Ltd., Southport.

**Ilford Tramways Committee** has accepted the tender of Messrs. Johnson & Nephew for copper wire at 9⅝d. per lb. Owing to the phenomenal drop in the price of raw copper, this price is stated to be 3 9-16d. per lb. less than was paid in January.

**Crossley Motors, Ltd.,** have recently received, among others, the following orders:—Rochdale Corporation, 20 (six-cylinder and "Condors"); Bury Corporation (six-cylinder); Leigh Corporation, 3 "Eagles" and Aberdeen 14 "Condors"; Batemen & Fines, Ltd., Notts (six-cylinder); Norfolk Motor Services, Yarmouth (six-cylinder); Linklines, Ltd., Glasgow, two "Sixes"; Smith's Motorways, Kirkaldy, two "Sixes"; Air Ministry 63 six-wheelers; the War Office, 14 six-wheelers. Of special interest are the orders from Leeds and Sheffield Corporations, each of which has ordered a double-deck omnibus with a Diesel engine.

**John I. Thornycroft & Co., Ltd.,** have recently received the following among other orders for various types of freight and passenger vehicles: Buenos Aires Pacific Railway Co., Ltd., six 3-ton six-wheel chassis; Central Uruguay Railway Co. (of Monte Video), Ltd., three 30-cwt. chassis; The China Bus Co., of Hongkong, three 20-seat omnibus chassis; Boots, Ltd., of Nottingham, three 6-ton six-cylinder freight chassis; the Distillers Co., Ltd., three 4-ton lorries. Repeat orders for one or more Thornycroft vehicles have been received from Talbot Serpell Transport Co., Ltd. (Reading), Belfast Co-operative Society, Ltd., Joseph Crosfield and Sons, Ltd., Northern Butchers Hide & Skin Co., Ltd. (Leeds), and Allen Everitt & Sons, Ltd. (Smethwick).

**Merthyr Corporation Omnibus Committee** has received the following tenders for the supply of four omnibuses:—Bristol Tramways and Carriage Co., Ltd., £1,288 8s. 9d. each net, extras, with sorbo rubber flooring, £15 10s. each net, delivery five-seven weeks; Leyland Motors, Ltd., £1,278 15s. each net, extras, with sorbo rubber flooring, £14 each net, N.I.F.E. type K.C.10 cell battery, £24 12s. each net, delivery seven weeks; Dennis Bros., Ltd., £1,218 each net, extras, with sorbo rubber flooring, £10 each net, delivery ten weeks from receipt of order; Associated Equipment Co., Ltd., £1,260 10s. each net, extras, moquette seat coverings, £5 per vehicle, with sorbo rubber flooring £10 per vehicle, if 6-cylinder engine instead of 4-cylinder an extra charge of £123 15s. per vehicle.

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**Bristol Tramways & Carriage Co., Ltd.,** have recently received repeat orders as follow from users of their passenger vehicles: Norwich Electric Tramways, three type B 4-cylinder, 4-wheel passenger chassis; Rotherham Corporation, seven type B 4-cylinder, 4-wheel passenger chassis; West Riding Automobile Co., Ltd., twelve 30-seat saloon omnibuses mounted on type B 4-cylinder chassis.

**Glasgow Tramways Committee** has accepted the following tenders: Edgar Allen & Co., Ltd., and the Titan Trackwork Co., Ltd., for special work points and crossings; Shaw (Glasgow), Ltd., for cast-iron pipes; Mr. J. M. Dempster, for a brake drum turning lathe; Stewart & Houston, for a crankshaft grinding machine. The Committee has also accepted the tenders of Mansons, Ltd., and S. F. Bowser & Co. for the supply of petrol pumps for the Larkfield garage extension.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. | Sept. 23 | 555 | 622 | + 67 | 25 | 14,548 | — 81 |
| „ Motor Buses | „ 23 | 233 | 329 | + 96 | 25 | 7,413 | + 1,372 |
| „ Total | „ 23 | 788 | 951 | + 163 | 25 | 21,961 | + 1,291 |
| Aberdeen Corp. | „ 24 | 4,697 | 4,940 | + 243 | 16¾ | 93,923 | + 1,059 |
| Ashton-u-Lyne Corp. | „ 27 | 958 | 870 | — 88 | 26 | 22,210 | — 1,755 |
| „ Motor Buses | „ 27 | 516 | 495 | — 21 | 26 | 12,994 | + 134 |
| „ Trolley Buses | „ 27 | 296 | 272 | — 24 | 26 | 6,775 | — 466 |
| „ Total | „ 27 | 1,770 | 1,637 | — 133 | 26 | 41,979 | — 2,087 |
| Ayr Corporation | „ 27 | 538 | 544 | + 6 | 19 | 13,523 | — 1,093 |
| Barrow Corporation | „ 20 | 607 | 577 | — 30 | 25 | 14,795 | — 1,166 |
| „ Motor Buses | „ 20 | 428 | 415 | — 13 | 25 | 10,660 | + 675 |
| „ Total | „ 20 | 1,035 | 992 | — 43 | 25 | 25,455 | — 491 |
| Belfast City | „ 26 | 11,075 | 11,526 | + 451 | 25½ | 294,868 | + 9,330 |
| „ Motor Buses | „ 26 | 1,077 | 1,306 | + 229 | 25½ | 33,243 | + 6,845 |
| „ Total | „ 26 | 12,152 | 12,832 | + 680 | 25½ | 328,111 | + 16,175 |
| Birkenhead Corp. | „ 28 | 1,668 | 1,445 | — 223 | 26 | 40,162 | — 4,398 |
| „ Motor Buses | „ 28 | 3,354 | 3,785 | + 431 | 26 | 98,349 | — 445 |
| „ Total | „ 28 | 5,022 | 5,230 | + 208 | 26 | 138,511 | — 4,843 |
| Birmingham Corp. | „ 23 | 27,298 | 25,867 | — 1,431 | 25 | 654,629 | — 23,201 |
| „ Motor Buses | „ 23 | 13,558 | 16,038 | + 2,480 | 25 | 284,905 | + 61,953 |
| „ Trolley Buses | „ 23 | 561 | 534 | — 27 | 25 | 13,535 | — 215 |
| „ Total | „ 23 | 41,417 | 42,439 | + 1,022 | 25 | 1,053,069 | + 38,537 |
| Blackburn Corp. | „ 24 | 1,860 | 1,755 | — 105 | 27¾ | 46,647 | — 4,207 |
| „ Motor Buses | „ 24 | Nil | 318 | + 318 | 27¾ | 8,139 | + 8,139 |
| „ Total | „ 24 | 1,860 | 2,073 | + 213 | 27¾ | 54,786 | + 3,932 |
| Bradford Corporation | „ 27 | 10,203 | 9,180 | — 1,023 | ... | ... | ... |
| „ Motor Buses | „ 27 | 3,292 | 3,087 | — 205 | ... | ... | ... |
| „ Trolley Buses | „ 27 | 1,067 | 1,951 | + 884 | ... | ... | ... |
| „ Miscellaneous | „ 27 | 280 | 277 | — 3 | ... | ... | ... |
| „ Total | „ 27 | 14,842 | 14,495 | — 347 | 26 | 369,051 | — 16,060 |
| Brighton Corporation | „ 28 | 2,802 | 2,860 | + 58 | 25¾ | 76,440 | + 1,995 |
| Burnley Corporation | „ 27 | 2,993 | 2,699 | — 294 | ... | ... | ... |
| „ Motor Buses | „ 27 | 620 | 657 | + 37 | ... | ... | ... |
| „ Total | „ 27 | 3,613 | 3,356 | — 257 | ... | ... | ... |
| Burton-on-Trent Corp. | „ 28 | 810 | 858 | + 48 | 26 | 22,057 | + 842 |
| Bury Corporation | „ 28 | 2,072 | 1,581 | — 491 | 25¾ | 46,609 | — 6,434 |
| „ Motor Buses | „ 28 | 676 | 1,401 | + 725 | 25¾ | 29,885 | + 17,842 |
| „ Total | „ 28 | 2,748 | 2,982 | + 234 | 25¾ | 76,494 | + 11,408 |
| Cardiff Corporation | „ 27 | 7,669 | 7,736 | + 67 | 25¾ | 202,159 | + 1,558 |
| Chatham and District | „ 18 | 1,374 | 1,188 | — 186 | 37 | 43,465 | + 236 |
| Chester Corporation | „ 21 | 430 | Nil | — 430 | 25 | Nil | — 11,169 |
| „ Motor Buses | „ 21 | Nil | 681 | + 681 | 25 | 16,740 | + 16,740 |
| „ Total | „ 21 | 430 | 681 | + 251 | 25 | 16,740 | + 5,571 |
| Chesterfield Corp. | „ 29 | 2,075 | 1,998 | — 77 | 26 | 50,052 | + 1,014 |
| Colchester Corp. | Oct. 1 | 602 | 620 | + 18 | 27 | 16,639 | + 1,710 |
| Colne Corporation | Sept. 24 | 674 | 647 | — 27 | 25 | 17,976 | — 399 |
| Coventry Corporation | „ 28 | 2,136 | 1,897 | — 239 | 26 | 51,413 | — 3,816 |
| „ Motor Buses | „ 28 | 1,634 | 1,715 | + 81 | 26 | 46,492 | + 5,535 |
| „ Total | „ 28 | 3,770 | 3,612 | — 158 | 26 | 97,905 | + 1,719 |
| Darlington Corp. | „ 27 | 1,004 | 1,128 | + 124 | 25¾ | 27,502 | + 2,309 |
| Derby Corporation | „ 20 | 2,577 | 2,446 | — 131 | 26 | 63,528 | — 2,008 |
| „ Motor Buses | „ 20 | 815 | 947 | + 132 | 26 | 23,762 | + 5,031 |
| „ Total | „ 20 | 3.392 | 3,393 | + 1 | 26 | 87,290 | + 3,023 |
| Dover Corporation | „ 27 | 450 | 461 | + 11 | 26 | 11,793 | + 356 |
| Dundee Corporation | „ 17 | 2,690 | 2,526 | — 164 | 17¾ | 45,546 | — 1,629 |
| „ Motor Buses | „ 17 | 868 | 1,178 | + 310 | 17¾ | 19,980 | + 4,999 |
| „ Total | „ 17 | 3 558 | 3,704 | + 146 | 17¾ | 65,526 | + 3,370 |
| East Ham Corp. | „ 27 | 2,397 | 2,374 | — 13 | 25½ | 59,420 | + 726 |
| Edinburgh Corp. | „ 30 | 14,039 | 14,195 | + 156 | 18¾ | 277,492 | + 5,516 |
| „ Motor Buses | „ 30 | 3,369 | 3,717 | + 348 | 18¾ | 70,580 | + 5,710 |
| „ Total | „ 30 | 17,408 | 17,912 | + 504 | 18¾ | 348,072 | + 11,226 |
| Exeter Corporation | Oct. 1 | 908 | 772 | — 136 | 27 | 21,872 | — 1,833 |
| „ Motor Buses | „ 1 | 192 | 412 | + 220 | 27 | 8,742 | + 4,840 |
| „ Total | „ 1 | 1,100 | 1,184 | + 84 | 27 | 30,614 | + 3,007 |
| Glasgow Corporation | Sept. 27 | 45,115 | 44,204 | — 911 | 17 | 732,213 | — 368 |
| „ Motor Buses | „ 27 | 6,169 | 9,667 | + 3,498 | 17 | 143,153 | + 54,027 |
| „ Total | „ 27 | 51,284 | 53,871 | + 2,587 | 17 | 875,366 | + 53,659 |
| Gloucester Corp. | „ 24 | 652 | 735 | + 83 | 25¾ | 18,198 | + 3,784 |
| Grimsby Corporation | „ 27 | 1,474 | 1,630 | + 156 | 26 | 41,943 | + 4,378 |
| Halifax Corporation | „ 23 | 4,633 | 5,151 | + 518 | 25½ | 130,824 | + 14,405 |
| Huddersfield Corp. | „ 27 | 6,521 | 6,589 | + 68 | 26 | 166,044 | — 2,045 |
| Hull Corporation | „ 27 | 5,975 | 5,702 | — 273 | 26 | 147,084 | — 3,772 |
| „ Motor Buses | „ 27 | 1,393 | 1,758 | + 365 | 26 | 40,960 | + 6,345 |
| „ Total | „ 27 | 7,368 | 7,460 | + 92 | 26 | 188,044 | + 2,573 |
| Ilford Corporation | „ 27 | 1,526 | 1,557 | + 31 | 25¾ | 39,020 | + 553 |
| Ipswich Corp. Trol.Bus | „ 27 | 1,352 | 1,451 | + 99 | 25¾ | 35,368 | + 1,948 |
| Isle of Thanet | „ 24 | 1,067 | 900 | — 167 | 38½ | 35,363 | — 4,229 |
| Kilmarnock Corp. | „ 27 | 465 | 508 | + 43 | 19¾ | 9,531 | + 427 |
| Lancashire Un. | „ 21 | 2,317 | 2.148 | — 169 | 37¾ | 80,374 | — 4,512 |
| „ Motor Buses | „ 21 | 4,718 | 5,097 | + 379 | 37¾ | 187,640 | + 24,688 |
| Leeds Corporation | „ 27 | 20,266 | 20,281 | + 15 | 25¾ | 515,355 | + 8,539 |
| Leicester Corp. | „ 27 | 8,753 | 8,589 | — 164 | 26 | 216,161 | + 350 |
| Lincoln Corp. | „ 14 | 966 | 1,002 | + 36 | 24 | 22,768 | + 76 |
| Liverpool Corp. | „ 27 | 27,243 | 26,727 | — 516 | 25¾ | 693,314 | — 12,122 |
| „ Motor Buses | „ 27 | 2.883 | 3,185 | + 302 | 25¾ | 85,765 | + 13,288 |
| „ Total | „ 27 | 30,126 | 29,912 | — 214 | 25¾ | 779,079 | + 1,166 |
| London County Coun. | Oct. 1 | 85,969 | 84,643 | — 1,326 | 26¾ | 2,172,187 | — 18,637 |
| Luton Corporation | Sept. 24 | 429 | 454 | + 25 | 25¾ | 10,953 | + 289 |
| Maidstone Corp. | „ 25 | 171 | Nil | — 171 | 25¾ | Nil | — 5,685 |
| „ Motor Buses | „ 25 | 366 | 297 | — 69 | 25¾ | 7,170 | — 550 |
| „ Trolley Buses | „ 25 | 312 | 604 | + 292 | 25¾ | 15,695 | + 7,807 |
| „ Total | „ 25 | 849 | 901 | + 52 | 25¾ | 22,865 | + 1,572 |
| Manchester Corp. | „ 27 | 35,811 | 32,162 | — 3,649 | 26 | 828,422 | — 75,942 |
| „ Motor Buses | „ 27 | 4,915 | 9,002 | + 4,087 | 26 | 224,126 | + 94,454 |
| „ Total | „ 27 | 40,726 | 41,164 | + 438 | 26 | 1,052,548 | + 18,512 |
| Middlesbrough Corp. | „ 23 | 1,107 | 1,003 | — 104 | 25½ | 26,096 | — 2,605 |
| „ Motor Buses | „ 23 | 535 | 557 | + 22 | 25½ | 14,410 | + 1,179 |
| „ Total | „ 23 | 1,642 | 1,560 | — 82 | 25½ | 40,506 | — 1,426 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty.Corp. | Sept. 27 | 10,404 | 8,382 | — 2,022 | 25¾ | 223,252 | — 37,454 |
| „ Motor Buses | „ 27 | 1,996 | 3,417 | + 1,421 | 25¾ | 81,752 | + 28,355 |
| „ Total | „ 27 | 12,400 | 11,799 | — 601 | 25¾ | 305,004 | — 9,099 |
| Newport Corporation | „ 20 | 1,654 | 1,195 | — 459 | 25 | 37,520 | — 4,137 |
| „ Motor Buses | „ 20 | 758 | 1,360 | + 602 | 25 | 22,771 | + 3,834 |
| „ Total | „ 20 | 2,412 | 2,555 | + 143 | 25 | 60,291 | — 303 |
| Northampton Corp. | „ 26 | 1,102 | 781 | — 321 | 25¾ | 26,923 | — 1,677 |
| „ Motor Buses | „ 26 | 666 | 1,102 | + 436 | 25¾ | 20,171 | + 3,011 |
| „ Total | „ 26 | 1,768 | 1,883 | + 115 | 25¾ | 47,094 | + 1,334 |
| Nottingham Corp. | „ 25 | 6,498 | 5,728 | — 770 | 25¾ | 146,233 | — 22,673 |
| „ Motor Buses | „ 25 | 2,563 | 3,519 | + 956 | 25¾ | 85,072 | + 26,593 |
| „ Trolley Buses | „ 25 | 611 | 1,213 | + 602 | 25¾ | 30,554 | + 15,562 |
| „ Total | „ 25 | 9,672 | 10,460 | + 788 | 25¾ | 261,859 | + 19,482 |
| Oldham Corporation | „ 27 | 3,589 | 3,344 | — 245 | 27 | 89,982 | — 5,762 |
| „ Motor Buses | „ 27 | 1,900 | 1,958 | + 58 | 27 | 53,650 | — 1,115 |
| „ Total | „ 27 | 5,489 | 5,302 | — 187 | 27 | 143,632 | — 6,877 |
| Plymouth Corp. | „ 25 | 3,804 | 3,692 | — 112 | 25¾ | 96,377 | — 4,259 |
| „ Motor Buses | „ 25 | 2,003 | 2,619 | + 616 | 25¾ | 64,330 | + 13,853 |
| „ Total | „ 25 | 5,807 | 6,311 | + 504 | 25¾ | 160,707 | + 9,594 |
| Portsmouth Corp. | „ 27 | 4,607 | 3,945 | — 662 | 26 | 117,258 | — 11,190 |
| „ Motor Buses | „ 27 | 2,125 | 3,247 | + 1,122 | 26 | 91,136 | + 34,985 |
| „ Total | „ 27 | 6,732 | 7,192 | + 460 | 26 | 208,394 | + 23,795 |
| Preston Corporation | „ 24 | 1,731 | 1,697 | — 34 | 25¾ | 42,443 | — 2,070 |
| „ Motor Buses | „ 24 | 506 | 529 | + 23 | 25¾ | 13,199 | + 741 |
| „ Total | „ 24 | 2,237 | 2,226 | — 11 | 25¾ | 55,642 | — 1,329 |
| Rawtenstall Corp. | „ 28 | 785 | 587 | — 198 | 25¾ | 16,745 | — 5,087 |
| „ Motor Buses | „ 28 | 538 | 682 | + 144 | 25¾ | 18,102 | + 4,498 |
| „ Total | „ 28 | 1,323 | 1,269 | — 54 | 25¾ | 34,847 | — 589 |
| Reading Corporation | „ 25 | 1,554 | 1,526 | — 28 | 26 | 37,106 | — 1,791 |
| „ Motor Buses | „ 25 | 950 | 1,079 | + 129 | 26 | 26,005 | + 2,384 |
| „ Total | „ 25 | 2,504 | 2,605 | + 101 | 26 | 63,111 | + 593 |
| Rochdale Corp. | Oct. 2 | 2,774 | 2,796 | + 21 | ... | 71,319 | — 748 |
| „ Motor Buses | „ 2 | 2,273 | 1,514 | — 758 | ... | 40,268 | + 5,072 |
| „ Total | „ 2 | 5,047 | 4,310 | — 737 | ... | 111,587 | — 5,820 |
| Rotherham Corp. | Sept. 29 | 2,821 | 2,818 | — 3 | 26 | 72,451 | + 2,020 |
| Salford Corporation | „ 28 | 11,455 | 10,941 | — 514 | 25¾ | 285,084 | — 4,146 |
| Sheffield Corp. | „ 27 | 21,431 | 20,543 | — 888 | 24¾ | 528,091 | — 17,004 |
| Southampton Corp. | „ 24 | 3,558 | 3,617 | + 59 | 26 | 90,185 | + 1,593 |
| „ Motor Buses | „ 24 | 856 | 896 | + 40 | 26 | 22,461 | + 2,561 |
| „ Total | „ 24 | 4,414 | 4,513 | + 99 | 26 | 112,646 | + 4,154 |
| Southend-on-Sea Corp. | Oct. 1 | 2,137 | 2.048 | — 89 | 26¾ | 62,632 | — 3,442 |
| „ Trolley Buses | „ 1 | 266 | 289 | + 20 | 26¾ | 9,039 | + 2,945 |
| „ Total | „ 1 | 2,406 | 2,337 | — 69 | 26¾ | 71,671 | — 497 |
| Southport Corp. | Sept. 27 | 1,356 | 1,300 | — 56 | 25¾ | 36,389 | — 848 |
| „ Motor Buses | „ 27 | 400 | 401 | + 1 | 25¾ | 11,807 | + 979 |
| „ Total | „ 27 | 1,756 | 1,701 | — 55 | 25¾ | 48,196 | + 131 |
| St. Helens Corp. | „ 23 | 1,996 | 2,099 | + 103 | 25½ | 51,719 | + 2,715 |
| Sunderland Corp. | „ 30 | 2,391 | 2,223 | — 168 | 26 | 65,848 | + 615 |
| „ Motor Buses | „ 30 | 266 | 749 | + 483 | 26 | 15,533 | + 9,695 |
| „ Total | „ 30 | 2,657 | 2,972 | + 315 | 26 | 81,381 | + 10,310 |
| Swindon Corp. | „ 24 | 852 | 1,007 | + 155 | 25¾ | 25,297 | + 4,961 |
| Wallasey Corp. | „ 27 | 1,266 | 1,138 | — 128 | 25¾ | 32,980 | — 2,936 |
| „ Motor Buses | „ 27 | 1,956 | 2,190 | + 234 | 25¾ | 63,714 | + 5,896 |
| „ Total | „ 27 | 3,222 | 3,328 | + 106 | 25¾ | 96,694 | + 2,960 |
| Walsall Corporation | „ 21 | 3,382 | 3,468 | + 86 | 25 | 86,265 | + 1,043 |
| Walthamstow Corp. | „ 27 | 2,551 | 2,477 | — 74 | 25¾ | 64,142 | — 374 |
| Warrington Corp. | „ 25 | 894 | 940 | + 46 | 26 | 22,986 | + 154 |
| „ Motor Buses | „ 25 | 465 | 523 | + 58 | 26 | 17,003 | + 1,481 |
| „ Total | „ 25 | 1,359 | 1,463 | + 104 | 26 | 39,989 | + 1,635 |
| West Ham Corp. | „ 25 | 6,358 | 6,004 | — 354 | 25¾ | 153,710 | + 152 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses | „ 28 | 2,832 | 2,402 | — 430 | 26 | 63,908 | — 9,544 |
| „ Trolley Buses | „ 28 | 3,428 | 3,372 | — 56 | 26 | 90,274 | + 3,609 |
| „ Total | „ 28 | 6,260 | 5,774 | — 486 | 26 | 154,182 | — 5,935 |
| York Corporation | „ 24 | 1,173 | 1,067 | — 106 | 26 | 27,264 | — 330 |
| „ Motor Buses | „ 24 | 430 | 566 | + 136 | 26 | 13,243 | + 3,230 |
| „ Trolley Buses | „ 24 | 64 | Nil | — 64 | 26 | Nil | — 1,363 |
| „ Total | „ 24 | 1,667 | 1,633 | — 34 | 26 | 40,507 | + 1,527 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or *M* | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| | | £ | £ | | £ | £ |
| Anglo-Argentine | Sept. 30 | £81,056 | £80,409 | 39 w | £3,195,047 | — £160,916 |
| Brazilian Traction $ | Aug. | 4,333,460 | 3,792,808 | 8 *m* | 32,160,185 | — 546,195 |
| British Columbia $ | July | 1,156,720 | 1,196,239 | 1 *m* | 1,196,239 | + 39,519 |
| Buenos Aires Lacroze | Sept. 28 | 11,111 | 10,563 | 13 w | 138,570 | — 11,320 |
| Burma E. Sup. Co. Rs. | Aug. | 61,309 | 66,418 | 12 *m* | 842,707 | — 11,962 |
| Calcutta ... Rs. | Sept. 27 | 125,324 | 114,042 | 38½ w | 4,309,956 | — 610,182 |
| Cape Town ... ... | Aug. | 27,636 | 24,690 | ... | ... | ... |
| Carthagena & Herrerias | Sept | 660 | 437 | 9 *m* | 7,292 | — 1,458 |
| Durban Corporation | Aug. | 25,619 | 25,071 | 1 *m* | 25,071 | — 548 |
| East India ... ... | Aug. | 4,152 | 3,948 | 1 *m* | 3,948 | — 204 |
| Kalgoorlie ... ... | June | 1,660 | 1,753 | 6 *m* | 9,886 | + 25 |
| Madras (2 weeks) Rs. | Sept. 30 | 38,594 | 43,339 | 38 w | 836,526 | + 45,843 |
| Para ... ... | Aug. | 15,224 | 12,681 | 9 *m* | 131,304 | — 2,022 |
| Port Elizabeth ... | Aug. | 7,402 | 6,955 | ... | ... | ... |
| Rangoon ... Rs. | Sept. | 122,850 | 147,775 | 9 *m* | 1,345,030 | + 267,189 |
| Shanghai ... $ | Aug. | 335,172 | 386,112 | 7 *m* | 2,679,699 | + 49,478 |
| Singapore ... ...$ | Aug. | 130,000 | 142,000 | 11 *m* | 1,510,000 | + 165,000 |
| Winnipeg ... ...$ | July | 497,935 | 452,212 | 7 *m* | 3,725,716 | — 112,297 |

## RAILWAY RECEIPTS.

| 39th Week ended Sept. 28th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 243,000 | — 13,000 | 332,000 | — 22,000 | 575 000 | — 35,000 | -1,084,000 |
| L.M.S R. | 541.000 | — 45,000 | 778.000 | — 114,000 | 1,319,000 | — 159,000 | -3,559,000 |
| L.N.E.R. | 353.000 | — 36,000 | 643,000 | — 111,000 | 996,000 | — 147,000 | -2,376,000 |
| S.R. | 323,000 | — 21,000 | 111,000 | — 11,000 | 434,000 | — 32,000 | — 461,000 |
| Totals | 1,460,000 | — 115,000 | 1,864,000 | — 258,000 | 3,324,000 | — 373,000 | -7,480,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| LONDON UNDERGROUND | | | | | | |
| Common Fund Cos. | Sept. 27 | 307,000 | 308,400 | + 1,400 | 11,730,800 | + 617,600 |
| Lond. & Sub. Group | „ 27 | 46,000 | 46,100 | + 100 | 1,727,600 | + 98,800 |
| METROPOLITAN RAILWAY | „ 27 | 37,300 | 36,600 | — 700 | 1,426,600 | + 18,800 |
| LIVERPOOL OVERHEAD | „ 28 | 1,720 | 1,553 | — 167 | 61,896 | — 4,635 |
| MERSEY RAILWAY ... | „ 27 | 4,321 | 4,336 | + 15 | 176,383 | + 4,071 |

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THE
# Tramway AND Railway World

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LONDON, OCTOBER 11, 1930.

## STREET IMPROVEMENTS FOR TOWN TRAFFIC.

The serious and difficult problem of carrying out street improvements in order to provide more room for road transport in congested town areas is raised in a fresh form by Mr. H. H. Gordon, who for many years was a member of the Highways Committee of the London County Council, in a letter published in Tuesday's "Times." Mr. Gordon points out that there is no reference to this question in Mr. Morrison's traffic scheme for London, and suggests that the new Traffic Authority should also be the Improvement Authority for London, as he foresees grave dangers unless this phase of the town traffic problem is dealt with simultaneously. He reminds us that the underground railways have been unable to relieve surface congestion, and that progress in London street improvement is deadly slow; it has taken forty years to remove the block at Shoreditch Church, and after three-quarters of a century, Cromwell-road still remains a dead end. With municipalities entirely divorced from traffic responsibilities, what inducement remains for them to undertake the onerous burdens of aiding surface traction? Mr. Gordon revives a problem that will have to be faced, not only in London, but in almost every town in the country. Narrow streets, dead ends, and ill-planned districts with buildings dumped in obstructive positions abound nearly everywhere, and the only effort made to improve matters has been, as Mr. Gordon says, a little local tinkering, no major scheme having been undertaken. For years the public demand has been for speedy transport, but in every town of any size, and in London particularly, the traffic congestion in the streets has become increasingly worse, owing to the lack of prevision of bygone generations and the apathy of the present age. We have in the past concentrated on producing vehicles built for speed, but in cities this benefit has been to a large extent nullified because there is not sufficient room for the traffic movement except at a crawling pace, and the innumerable halts lengthen to an exasperating degree the time for private and public vehicles alike over important short distances. In short, while sparing no effort in the production of vehicles of the kind demanded by modern conditions, we have neglected to provide space for them where they are most in use. This work of street improvement on a comprehensive scale is long overdue, and improvement authorities which would carry out such schemes simultaneously with traffic reform, both in London and throughout the country, would be performing a service that is imperatively necessary.

## BRIGHTON MAIN LINE ELECTRIFICATION.

IMPORTANT ORDERS FOR ROLLING STOCK EQUIPMENT.

The Southern Railway has placed with the Metropolitan-Vickers Electrical Co. an order for electric railway equipment which is one of the most important of recent years. It covers the supply of complete electrical equipments, including motors, control gear, lighting, heating and compressor apparatus, for 104 motor coaches and 104 trailer coaches.

Most of this plant is for the new rolling stock to be used on the forthcoming electrified service to Brighton, the apparatus for this service comprising electrical equipments for forty 4-coach train units, each unit consisting of two motor coaches and two trailer coaches. The remainder is for general extension of the rolling stock of the electrified system and comprises electrical equipments for twelve 3-coach train units and six 2-coach trailer units. The 3-coach train units each consist of two motor coaches with a trailer coach between.

All the equipment will be similar to that which has been supplied by the Metropolitan-Vickers Electrical Company on previous contracts. Each motor coach will be equipped with two 275 h.p. motors of the totally enclosed self-ventilated type. The motors, which are of the largest size used for motor coach service in this country, are arranged in pairs on the bogies underneath the driving compartments at the two ends of the train unit. Control gear will be of the Metropolitan-Vickers all-electric type with automatic acceleration.

With regard to the heating equipment an interesting and novel feature of the equipments will be the provision of electric water heating for the lavatory compartments. The power will be taken from the 600 volt main, and each heater will be controlled by a contactor automatically operated when the water-tap is turned on or off, so that the heater is only in circuit when the supply of hot water is required.

This contract is the sixth of considerable magnitude which has been placed with the Metropolitan-Vickers Electrical Co. for train equipments for the Southern Railway. It will bring the total of Metrovick-equipped stock on the system to 668 motor coaches and 864 trailer coaches. A feature of interest in connection with the existing equipment is that the maintenance cost incurred has been remarkably low, probably the lowest of any railway in the world.

The value of the present contract amounts to rather more than £250,000.

## LIVERPOOL TRANSPORT DIFFICULTIES.

Liverpool City Council has referred back to the Tramways Committee recommendations (1) to start an experimental omnibus service on the Pier Head to Carr-lane route; (2) against the employment of omnibuses to relieve congestion in the inner parts of the city; and (3) to delegate to the manager the duty of revising fares, routes and services. Several members expressed dissatisfaction with the report against the use of omnibuses in the inner districts. Sir Thomas White, speaking of the Carr-lane proposal, said the route chosen was a preposterous one, and instead of delegating responsibility to the manager he suggested that the Committee should set up machinery for dealing with the whole subject in conjunction with the recent report of Sir Henry Maybury on Liverpool traffic.

Mr. F. C. Wilson, chairman of the Tramways Committee, said that the majority of people in Liverpool would not use omnibuses at a higher fare if tramcars were available, and that the running of a competitive service, except for short periods of the day, was not justified. The Carr-lane route had been chosen because the district was now served partly by tramcars and partly by omnibuses, and because also next year some £13,000 would have to be spent on the track. The only way to make omnibuses pay was to charge in proportion to the costs, and to provide stopping places where short-distance passengers could be picked up, so that the revenue per bus-mile would be increased.

## LONDON TRAFFIC UNIFICATION.

The proposal of the Government for the unification of passenger traffic within a 25-mile radius of Charing Cross has, on the whole, met with a favourable reception.

Sir Josiah Stamp, chairman of the L.M.S. Railway, has defined the attitude of the railways as one of friendliness. The Minister of Transport has stated that there would be such great difficulty in bringing the suburban railways into the scheme that the Government does not propose to include them. Sir Josiah Stamp says that the railway companies recognise the need of co-ordination, and they must not be left out of the co-ordinating arrangements. He believes it will be possible to participate in a scheme of allocating receipts, but until the relation of the suburban railway services to competing road services has been defined, it will not be possible for the railways to spend great sums in electrification.

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## NOTTINGHAM TRANSPORT PROTECTION.

TROLLEYBUSES TO BE EXTENDED.

Alderman A. Turney, chairman of the Nottingham Transport Committee, in presenting the annual report at a meeting of the Town Council on October 6, said that the net profit on the tramways last year was £27,305, and on the trolleybuses £4,900, giving a total of £32,205. As the loss on the petrol omnibuses was reduced from £9,000 to £5,022, there was a net profit on the transport undertaking of £27,183.

Commenting on the Corporation Bill which was passed in the last session, he said they had now received all the powers asked for within their own boundaries, and they could, without going to Parliament, install the trolleybus system on any of their routes. They had also secured protection against outside people who previously were allowed to superimpose their vehicles upon the city. So far as routes outside their boundaries were concerned, they had powers to convert but not to extend. The Committee considered the Bill well worth the expenditure. By the protection obtained inside the city they would save the cost of the Bill within the next twelve months.

In reply to a question, Alderman Turney said that the tramcars had been slightly speeded up to 7.34 miles per hour. The average for the whole of the United Kingdom was 8.3 miles per hour. It was the intention of the Committee steadily to substitute trolleybuses for the electric tramways. Regarding workmen's tickets, Alderman Turney said that in addition to the eleven million such tickets sold last year, there were 5¼ million children's tickets. These were all sold at a loss. There were limits to the concessions they could make, unless the Council subsidised them. In his opinion the line of demarcation between workmen and other people who paid full fare had disappeared. Workmen were travelling after 8 o'clock and "well-to-do" people before 8 o'clock.

## B.T.H. EQUIPMENT FOR LONDON RAILWAYS.

Control equipments numbering 160 for new motor and trailer cars of the London Electric Railways are to be supplied by the British Thomson-Houston Co., Ltd., Rugby. It will be remembered that in January, 1928, this company received the order for 561 control equipments for the motor and trailer coaches constructed under Lord Ashfield's scheme for speeding up and increasing the travelling facilities on the London Underground Railways. All the latest improvements are embodied in the design of the new equipments, which include circuit-breakers, reversers, master controllers, cut-out switches, contactor control gear, relays, switchboards, etc.

## PERSONAL.

**Councillor A. Aplin,** who has been selected by the Labour Party of Deptford Borough Council for election as Mayor, is secretary of the L.C.C. Tramway Workers' Union. He has been a member of the Council for eleven years.

**Mr. C. W. Jackson,** selected from a number of candidates for the position of general manager and engineer of Great Yarmouth electricity undertaking, has withdrawn his application and new applications are being invited for the position.

**Yorkshire Panel Nomination.**—Chesterfield Corporation has nominated Alderman H. Cropper, vice-chairman of the Transport Committee, to the panel from which one of the traffic commissioners for the Yorkshire area will be selected by the Minister of Transport.

**Mr. Herbert Morrison,** Minister of Transport, has appointed Mr. Aubrey Clark to be his private secretary in the place of Mr. G. F. Stedman, who has been promoted; and **Lord Ponsonby,** Parliamentary Secretary to the Ministry of Transport, has appointed Mr. S. S. Wilson to be his private secretary in place of Mr. Aubrey Clark.

**Bradford Tramways Manager.**—Bradford Corporation has appointed Mr. T. Stirk, traffic superintendent, as acting tramways manager until such time as a new manager is appointed and takes office. Mr. R. H. Wilkinson, the retiring manager and engineer, has been granted a retiring allowance. The Committee has decided to advertise for a successor at a minimum salary of £1,250, rising to a maximum of £1,750 per annum.

**Mr. H. A. Blackburn's** resignation of the position of general manager of Keighley Corporation Tramways, upon appointment as transport manager at Great Yarmouth, was referred to by the Mayor at the October meeting of Keighley Council. The Mayor remarked that Mr. Blackburn was going to take charge of a larger undertaking. They extended to him their best wishes, and hoped he would find his new position congenial. Alderman Smith said that Mr. Blackburn was the fifth young man who had gone from Keighley to more important positions. One former manager was in Africa, and the others at Portsmouth, Plymouth and Southend.

**The Consolidated Pneumatic Tool Co., Ltd.,** 170, Piccadilly, London, has issued another edition of their pneumatic tool catalogue. It contains full details and illustrations of their hammers and drills. Several additions have been made to these lines, and a large range of jam riveters is also shown. A section on the care of pneumatic tools gives some useful advice.

**New Cars at Dundee.**—The first of ten new tramcars for Dundee Corporation Tramways has been delivered. They are being constructed by the Brush Electrical Engineering Co., Ltd., of Loughborough, and are luxuriously furnished. There are moquette covered seats in the lower saloon and red covered antique hide seats in the upper saloon, all fitted with swing backs.

## MISCELLANEOUS NEWS AND NOTES.

**Leeds Transport Committee** has obtained sanction for a loan of £12,000 for the purchase of omnibuses.

**Eastbourne Corporation** is seeking sanction to borrow £8,000 for the extension of the central motor coach station.

**Ripon Watch Committee** has granted the application of the United Automobile Services, Ltd., for the licensing of 38 additional vehicles.

**Saving On Petrol.**—Oldham Tramways Department reports that the reduction in the price of petrol gives an annual saving of about £1,600 a year.

**Cheltenham Watch Committee** has granted the application of Cliff's, Ltd., for five omnibus licences for their service between London and Llanelly.

**Plymouth Watch Committee** intends to make it a condition of licensing double-deck omnibuses that at least two fire extinguishers are provided in each vehicle.

**L.C.C. Tramcars Collide.**—Four passengers were slightly injured yesterday when two L.C.C. tramcars came into collision at the junction of Park-road and Battersea Bridge-road.

**Co-ordination at Blackburn.**—A sub-committee has been appointed by Blackburn Tramways Committee to report upon the question of co-ordination of the tramway and omnibus services.

**Hull Tramways Committee** has considered the provision of an omnibus station for out of town omnibuses, and has asked the sub-committee if a site is available in the New-street area.

**Progress with the Bermudan Railway.**—It is understood that the contractors for the Bermuda Electric Railway, Messrs. Balfour, Beatty & Co., expect to complete the undertaking within a year.

**Ripon Watch Committee** has decided to issue licences to "outsiders" only in respect of motor vehicles for which a certificate of efficiency for the hackney carriage licences of their respective areas is produced.

**Dover Tramway Extension.**—The Ministry of Transport has extended the time limit for the completion of the tramways authorised by the Dover, St. Margaret's and Martin Hill Light Railways Order, 1909, until October 11, 1931.

**Heavy Oil Omnibuses for Manchester.**—Councillor I. Brassington, chairman of Manchester Corporation Transport Committee, announces that probably Manchester will soon have a few heavy oil omnibuses in service as an experiment.

**More Passengers at Bradford.**—The annual report of Mr. R. H. Wilkinson, general manager of Bradford Corporation Tramways, for the year ended March 31, 1930, shows an increase of 46,912 passengers. The total amounted to 105,659,391.

**Stockton Corporation** has decided to approach the Middlesbrough Corporation to ascertain whether they would agree to expedite the replacement of the Tees-side Tramways by 'buses, and suggest fixing an earlier date than the two years fixed by the Act.

**The Institute of Transport.**—The opening meeting of the new session of the Institute of Transport will be held on Monday next, at 5.30 p.m., at the Institution of Electrical Engineers. The Hon. Sir Arthur Stanley will deliver his address as president.

**Suggested Leicester Tramway Extension.**—Alderman G. Banton, chairman of Leicester Tramways and Omnibus Committee, suggests laying a sleeper tramway track from the city to Bradgate Park when Leicester gets authority to run outside the city boundaries.

**Superannuation Act Not Wanted.**—Of the 230 employees in the Northampton Corporation Tramways Department only 85 have asked to be included under the Local Government and Other Officers' Superannuation Act (1922). The Council will take no further action.

**County Boroughs and London Traffic Scheme.**—In connection with the proposed traffic scheme for London it is considered likely that the three county boroughs outside the London area—Croydon, East Ham and West Ham—will form themselves into a group to protect their interests.

**Electrical Extensions at Liverpool.**—Sanction has been obtained by Liverpool Tramways and Electric Power and Lighting Committee to borrow £300,000 for expenditure on unspecified electricity mains, and £13,127 in respect of plant and foundations for Lister Drive Power Station.

**Walsall Transport Committee** has purchased a row of fourteen houses situated immediately in front of their Birchills garages. It is intended ultimately to house a special emergency and breakdown staff in these houses, and to connect them with the traffic control office by private telephone.

**Glasgow Omnibus Employees' Wages.**—The drivers and conductors on the Corporation omnibuses have asked that the existing scale of 60s. to 66s. per week for drivers should be raised to 74s. to 80s., and that the scale for conductors should be increased from 55s.-60s. to 65s.-70s. The application, which if granted would cost the Transport Department, it is estimated, £60,000 additional in wages in the year, has been referred to the manager, and later it will come before the Wages and Conditions of Service Committee.

**Lanarkshire Traction Co.** has discontinued its tramway services on the greater part of its routes, and replaced them by omnibuses. The company has bought 50 Daimler omnibuses with C.F.6 chassis. It is anticipated that fifty or even one hundred additional vehicles will be required. The bodies, which seat 32, have been built by the Hoyal Body Corporation, Ltd. Eventually the whole of the forty-two miles of tramways will be scrapped, and omnibuses used throughout these routes. The routes on which the omnibuses will run vary in length from three to 24 miles, the latter being the distance between Glasgow and Whitburn via Holytown and Tannochside.

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**A New Non-Skid Road.**—Mr. R. G. Clarry, chairman of the British Road Tar Association, states that a new type of non-skid road surface which is being perfected in this country is approaching the stage when details may be announced. It is of a special kind of tar macadam which is "absolutely non-skid."

**Leeds Tramway Parcel Service.**—Leeds Tramways Department, which has an arrangement with authorities of other towns for the joint working of a parcel collection and delivery service over the most of the West Riding, has, by similar arrangements, begun an extended parcel service as far as Manchester and Liverpool.

**London Tube Extension.**—The work is now in progress on the first section of the London Underground Railway's scheme for the extension of the Piccadilly Tube from Hammersmith to Northfields. The work involves an expenditure of nearly £180,000, and is expected to take eighteen months. The contractors for this part of the work are Balfour, Beatty & Co., Ltd.

**New Omnibuses at Chatham.**—Mr. E. C. Bousfield, manager of the Medway Traction Co., has stated that the company has ordered 51 of the latest type of Leyland omnibuses, which will cover all the old Chatham-Rochester-Gillingham tramway routes. It is intimated that, while there may be a slight increase in the fares on certain routes, other fares will remain unchanged.

**Altrincham Omnibus Route.**—Manchester City Council has approved the scheme to substitute omnibuses for the tramway from the city boundaries to Altrincham, about eight miles. Negotiations with the other local authorities concerned are proceeding, and it is expected that it will be three months before the omnibus service can be started. Double-deck vehicles carrying 50 passengers will be used.

**Wage Increase Refused.**—Sunderland Corporation workmen's application for a penny per hour increase in wages has been refused by the Industrial Court of Arbitration on the ground that the depression at Sunderland did not warrant an increase. It was stated that the increase asked for would entail a rate of nearly 3d. in the pound, which would have to be borne by many ratepayers not so well off as Corporation workmen.

**Proposed Omnibus Station at Aldershot.**—Negotiations are taking place between Aldershot and District Traction Co. and the Southern Railway Co. for the provision of a large motor omnibus station at Aldershot. The proposal is that railway land on the corner of Station-road and the Grove should be made the terminus for all omnibus transport to and from Aldershot. All vehicles would run into the station at one end and leave from the other.

**Appointment of Certifying Officers.**—The Ministry of Transport is about to appoint the certifying officers in the Area Traffic Commissioners' offices, at salaries of £600 to £700 per annum inclusive, with travelling and other expenses on the usual Civil Service scale. The duties of the appointments will be concerned with the issue of certificates of fitness of public service vehicles, and only applicants who have had technical training and practical experience as mechanical engineers will be considered. Further particulars will be found in our advertisement columns.

**Sir H. Austin on Automobile Design.**—In his presidential address to the Institution of Automobile Engineers on Wednesday, Sir Herbert Austin said that the motor car of the future would have many fewer parts, and that cabs, omnibuses and coaches would probably have their engines at the rear. How much the out-of-date method of calculating horse-power for taxation purposes had cost the British nation in lost export trade it would be impossible to estimate. The American manufacturer had benefited enormously by this persistent Government folly.

**Manchester's Quest for Information.**—Sanction has been given by Manchester Corporation to the Tramways Committee visiting Bradford, Wolverhampton, and other towns to investigate the trolleybus system. Members of the Electricity Committee expressed a hope that the investigation would be most thorough, as the Electricity Department received a considerable revenue from the Transport Committee. They suggested that motor omnibuses ought not to be substituted for the Altrincham tramways unless the Council were perfectly satisfied that the trolleybus was not as suitable a vehicle.

**Bexley Tramways.**—The tramways operated by Bexley Urban Council are approaching a crisis. Mr. A. J. Abraham, general manager and electrical engineer, has pointed out that the thirty-year-old cars cannot last much longer. The Commissioner of Police has called attention to the state of the track, and the facts have been laid before the Minister of Transport. An application has been made to the Council for permission to run an omnibus service, although hitherto such services have been refused in order to give the tramways a monopoly, but it is believed that this embargo must soon be lifted.

**Cardiff Corporation and Russian Petrol.**—At a meeting of Cardiff Council, Councillor A. E. Shippobotham stated that when the Tramways Committee decided to recommend acceptance of the tender of Russian Oil Products, Ltd., for the supply of petrol for the ensuing year, the information placed before them was "inaccurate and incorrect." Councillor H. Johns, chairman of the Tramways Committee, suggested that the resolution be altered so that the tender would not be accepted until the Committee were satisfied that R.O.P. were on the King's Roll. A letter from the Cardiff branch of R.O.P. stated that they had made application to be placed on the King's Roll. Councillor Johns added that the acceptance of the tender would mean a saving of £2,500 to the city. After further discussion the decision of the Committee recommending acceptance of the tender was referred back.

**The Leeds Diesel Omnibus.**—Councillor Brassington, chairman of Manchester Transport Committee, has informed the City Council that he is of opinion that the Diesel engine, which he had seen in a Leeds Corporation omnibus, "would sound the knell not only of the tramcar, but of the petrol-driven omnibus."

**Coventry Tramway Fares.**—At a meeting of Coventry City Council, Councillor T. J. Harris stated, in connection with the recent fares revision, that although fares for the short stages had been lowered, those for the long stages had been raised, and that if this was represented as a reduction the public had been deceived. Councillor O. M. Flinn, chairman of the Transport Committee, stated that 80 per cent. of the passengers were paying less, although 20 per cent. might be paying the same or more. It was almost certain that there would have to be a return to the old fares in January.

**International Tramways Union.**—Since the reference to the special meeting in Paris of the International Tramways, Light Railways and Public Transport Union, which appeared in last week's issue, a number of representatives of tramway interests in this country have arranged to attend. Many of them will travel from London to Paris by omnibus, which will leave the Waldorf Hotel, London, on Friday, October 17. The following managers have intimated that they will attend: A. C. Baker (Birmingham), Wm. Forbes (Cardiff), P. Ellison (Eastbourne), W. R. Elliott (East Ham), F. A. Fitzpayne (Edinburgh), J. C. Williams (Erith), L. Mackinnon (Glasgow), A. A. Blackburn (Huddersfield), L. E. Harvey (Ilford), Geo. Rock (Lincoln), R. Stuart Pilcher (Manchester), T. P. Easton (Newcastle-upon-Tyne), John F. Cameron (Northampton), W. G. Marks (Nottingham), Ben Hall (Portsmouth), S. Parsons (Ramsbottom), C. L. E. Stewart (Rawtenstall), P. J. Baker (Southampton), W. Vane Morland (Walsall), C. Owen Silvers (Wolverhampton). Among others who will be present are: Councillor Adam M. Millar (Convener, Edinburgh), Bailie P. J. Dollan (Convener, Glasgow), H. Gerrard (engineer, Glasgow Tramways), Councillor I. Brassington (chairman, Manchester), J. Beckett, H. J. Ferguson, H. E. Townell and A. M. Willcox (London).

## FINANCIAL.

**Hastings Tramways Co.** announces that it is again unable to meet the interest due on its first debenture stock and also on its 7 per cent. redeemable notes. The company failed to meet its interest due in October of last year.

**Hurst, Nelson & Co., Ltd.,** rolling stock manufacturers, Motherwell, made a gross profit for the year ended July 19 of £81,139, compared with £74,524 for the previous year. A dividend of 20 per cent. on the ordinary shares is recommended, the same as last year.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended October 8 amounted to £84,406, a decrease of £567 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to October 8 (27 2-7 weeks) the total receipts were £2,256,993, a decrease of £19,511.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended September 20 gave total receipts of £424,361, or £4,031 more than in the corresponding week of last year. The aggregate receipts for twenty-five weeks amounted to £10,565,937, an increase of £115,444 over the corresponding period of last year.

**Underground Debenture Stock.**—On Wednesday last the London Electric Railway Co. and the Central London Railway Co. advertised prospectuses offering for sale £4,300,000 of five per cent. redeemable debenture stock. The price of the issue was £99 10s. per cent., and the stock is redeemable at par on January 1, 1995, or at the option of the company in whole or part on January 1, 1985, or on any half-yearly interest date thereafter, at six months' notice. The lists were closed within a few minutes after opening, and the issue was largely oversubscribed.

## CONTRACTS.

**Leeds Tramways Committee** has accepted the tender of British Insulated Cables, Ltd., for three miles of trolley wire.

**Plymouth Transport Committee** has obtained sanction to borrow £10,200 for the purchase of six double-deck omnibuses.

**Southport Corporation** has ordered fourteen "Emperor" double-deck omnibuses from the Vulcan Motor & Engineering Co., Ltd.

**Plymouth Corporation Tramways Committee** has accepted the tender of Murex, Ltd., for the supply of welding plant at £250.

**Bristol Tramways and Carriage Co.** have purchased two miles of "Phono" electric trolley wire from the Equipment and Engineering Co., Ltd.

**Plymouth Transport Committee** has asked the borough engineer to obtain quotations for the supply of 20 motor vehicles for refuse collection.

**Bombay Electric Supply and Tramways Co.** have placed an order with the Equipment and Engineering Co., Ltd., for a "TA" type magnetic crack detector.

**Crossley Motors, Ltd.,** have placed an order for a Luchard H.8 high-pressure air compressor for inflating giant pneumatic tyres, with the Equipment and Engineering Co., Ltd.

**Oil Installations (1928), Ltd.,** have received orders from Bristol Tramways and Carriage Co., Birmingham and Midland Omnibus Co., and Leigh Corporation for Hammond low-pressure petrol metering systems.

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**Liverpool Tramways Committee** has accepted the tender of British Insulated Cables, Ltd., for 5,000 35-in. and 200 65-in. copper bonds.

**St. Helens Tramways Committee** has recommended the acceptance of the tender of Ransomes, Sims & Jefferies, Ltd., Ipswich, for the supply of five double-deck trolleybuses.

**Liverpool Corporation** has placed an order for nine "Prince" single-deck omnibuses with the Vulcan Motor & Engineering Co., Ltd. The Corporation has had one omnibus of this type in service on test for six months.

**Walsall Transport Committee** has accepted tenders from the Associated Equipment Co., Ltd., and Dennis Brothers, Ltd., for the supply of double-deck motor omnibus chassis, and from the Brush Electrical Engineering Co., Ltd., of Loughborough, Short Brothers, Ltd., of Rochester, and J. C. Beadle, Ltd., of Dartford, for double-deck omnibus bodies.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or — | Wks | Aggregate. 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. | Sept. 23 | 555 | 622 | + 67 | 25 | 14,548 | — 81 |
| „ Motor Buses | „ 23 | 233 | 329 | + 96 | 25 | 7,413 | + 1,372 |
| „ Total | „ 23 | 788 | 951 | + 163 | 25 | 21,961 | + 1,291 |
| Aberdeen Corp. | Oct. 1 | 4,924 | 5,095 | + 171 | 17½ | 99,018 | + 1,230 |
| Ashton-u-Lyne Corp. | Sept. 27 | 958 | 870 | — 88 | 26 | 22,210 | — 1,755 |
| „ Motor Buses | „ 27 | 516 | 495 | — 21 | 26 | 12,994 | + 134 |
| „ Trolley Buses | „ 27 | 296 | 272 | — 24 | 26 | 6,775 | — 466 |
| „ Total | „ 27 | 1,770 | 1,637 | — 133 | 26 | 41,979 | — 2,087 |
| Ayr Corporation | Oct. 4 | 592 | 546 | — 46 | 20 | 14,070 | — 1,139 |
| Barrow Corporation | „ 4 | 606 | 564 | — 42 | 27 | 15,902 | — 1,255 |
| „ Motor Buses | „ 4 | 409 | 397 | — 12 | 27 | 11,452 | + 648 |
| „ Total | „ 4 | 1,015 | 961 | — 54 | 27 | 27,354 | — 607 |
| Belfast City | „ 3 | 11,604 | 11,561 | — 43 | 26½ | 306,429 | + 9,287 |
| „ Motor Buses | „ 3 | 1,113 | 1,356 | + 243 | 26½ | 34,599 | + 7,088 |
| „ Total | „ 3 | 12,717 | 12,917 | + 200 | 26½ | 341,028 | + 16,375 |
| Birkenhead Corp. | „ 5 | 1,713 | 1,470 | — 243 | 27 | 41,632 | — 4,667 |
| „ Motor Buses | „ 5 | 3,191 | 3,832 | + 641 | 27 | 102,161 | — 679 |
| „ Total | „ 5 | 4,904 | 5,302 | + 398 | 27 | 143,793 | — 5,346 |
| Birmingham Corp. | Sept. 30 | 28,214 | 26,118 | — 2,096 | 26 | 680,748 | — 25,298 |
| „ Motor Buses | „ 30 | 14,146 | 16,346 | + 2,200 | 26 | 401,251 | + 64,153 |
| „ Trolley Buses | „ 30 | 557 | 516 | — 41 | 26 | 14,051 | — 256 |
| „ Total | „ 30 | 42,917 | 42,980 | + 63 | 26 | 1,096,050 | + 38,599 |
| Blackburn Corp. | Oct. 1 | 1,978 | 1,712 | — 266 | 26½ | 48,362 | — 4,481 |
| „ Motor Buses | „ 1 | Nil | 312 | + 312 | 26½ | 8,451 | + 8,451 |
| „ Total | „ 1 | 1,978 | 2,024 | + 46 | 26½ | 56,813 | + 3,970 |
| Bradford Corporation | „ 4 | 10,363 | 9,239 | — 1,124 | ... | ... | ... |
| „ Motor Buses | „ 4 | 3,358 | 3,142 | — 216 | ... | ... | ... |
| „ Trolley Buses | „ 4 | 1,074 | 1,966 | + 892 | ... | ... | ... |
| „ Miscellaneous | „ 4 | 318 | 278 | — 40 | ... | ... | ... |
| „ Total | „ 4 | 15,113 | 14,625 | — 488 | 27 | 383,676 | — 16,548 |
| Brighton Corporation | „ 5 | 2,547 | 2,568 | + 21 | 26½ | 79,008 | + 2,016 |
| Burnley Corporation | „ 4 | 3,205 | 2,826 | — 379 | — | ... | ... |
| „ Motor Buses | „ 4 | 666 | 677 | + 11 | ... | ... | ... |
| „ Total | „ 4 | 3,871 | 3,503 | — 368 | .. | ... | ... |
| Burton-on-Trent Corp. | „ 5 | 971 | 895 | — 76 | 26 | 22,952 | + 766 |
| Bury Corporation | „ 5 | 1,997 | 1,658 | — 339 | 26½ | 48,267 | — 6,771 |
| „ Motor Buses | „ 5 | 630 | 1,419 | + 789 | 26½ | 31,304 | + 18,630 |
| „ Total | „ 5 | 2,627 | 3,077 | + 450 | 26½ | 79,571 | + 11,859 |
| Cardiff Corporation | „ 4 | 7,947 | 7,959 | + 12 | 26½ | 210,118 | + 1,570 |
| Chester Corporation | „ 5 | 435 | Nil | — 435 | 27 | Nil | — 12,039 |
| „ Motor Buses | „ 5 | Nil | 694 | + 694 | 27 | 18,110 | + 18,110 |
| „ Total | „ 5 | 435 | 694 | + 259 | 27 | 18,110 | + 6,071 |
| Chesterfield Corp. | „ 6 | 2,115 | 2,139 | + 24 | 27 | 52,191 | + 1,038 |
| Colchester Corp. | „ 8 | 548 | 620 | + 72 | 28 | 17,261 | + 1,777 |
| Colne Corporation | „ 8 | 730 | 700 | — 30 | 27 | 19,312 | — 463 |
| Coventry Corporation | „ 5 | 2,130 | 1,977 | — 153 | 27 | 53,390 | — 3,969 |
| „ Motor Buses | „ 6 | 1,701 | 1,762 | + 61 | 27 | 48,254 | + 5,596 |
| „ Total | „ 5 | 3,831 | 3,739 | — 92 | 27 | 101,644 | + 1,627 |
| Darlington Corp. | „ 4 | 1,064 | 1,062 | — 2 | 26½ | 28,565 | + 2,307 |
| Derby Corporation | „ 4 | 2,661 | 2,491 | — 170 | 27 | 66,020 | — 2,178 |
| „ Motor Buses | „ 4 | 844 | 952 | + 108 | 27 | 24,715 | + 5,139 |
| „ Total | „ 4 | 3,505 | 3,443 | — 62 | 27 | 90,735 | + 2,961 |
| Dover Corporation | „ 4 | 417 | 438 | + 21 | 27 | 12,231 | + 376 |
| Dundee Corporation | Sept. 23 | 2,634 | 2,604 | — 30 | 18½ | 48,151 | — 1,659 |
| „ Motor Buses | „ 23 | 862 | 1,183 | + 321 | 18½ | 21,164 | + 5,320 |
| „ Total | „ 23 | 3,496 | 3,787 | + 291 | 18½ | 69,315 | + 3,661 |
| East Ham Corp. | Oct. 4 | 2,464 | 2,381 | — 83 | 26½ | 61,200 | + 666 |
| Edinburgh Corp. | Sept. 27 | 14,080 | 14,172 | + 92 | 19½ | 291,665 | + 5,608 |
| „ Motor Buses | „ 27 | 3,345 | 3,621 | + 276 | 19½ | 74,201 | + 5,986 |
| „ Total | „ 27 | 17,425 | 17,793 | + 368 | 19½ | 365,866 | + 11,594 |
| Exeter Corporation | Oct. 8 | 889 | 773 | — 115 | 28 | 22,646 | — 1,949 |
| „ Motor Buses | „ 8 | 191 | 428 | + 236 | 28 | 9,170 | + 5,077 |
| „ Total | „ 8 | 1,080 | 1,201 | + 121 | 28 | 31,816 | + 3,128 |
| Glasgow Corporation | Sept. 27 | 45,115 | 44,204 | — 911 | 17 | 732,213 | — 368 |
| „ Motor Buses | „ 27 | 6,169 | 9,667 | + 3,498 | 17 | 143,153 | + 54,027 |
| „ Total | „ 27 | 51,284 | 53,871 | + 2,587 | 17 | 875,366 | + 53,659 |
| Gloucester Corp. | Oct. 1 | 779 | 812 | + 33 | 26½ | 19,010 | + 3,817 |
| Grimsby Corporation | „ 4 | 1,520 | 1,612 | + 92 | 27 | 43,555 | + 4,509 |
| Halifax Corporation | Sept. 30 | 4,847 | 5,076 | + 229 | 26½ | 135,899 | + 14,634 |
| Huddersfield Corp. | Oct. 4 | 6,497 | 6,514 | + 17 | 27 | 172,559 | — 2,028 |
| Hull Corporation | „ 4 | 6,445 | 5,845 | — 600 | 27 | 152,929 | — 4,372 |
| „ Motor Buses | „ 4 | 1,437 | 1,804 | + 367 | 27 | 42,765 | + 6,713 |
| „ Total | „ 4 | 7,882 | 7,649 | — 233 | 27 | 195,694 | + 2,341 |
| Ilford Corporation | „ 4 | 1,572 | 1,568 | — 4 | 26½ | 40,588 | + 212 |
| Ipswich Corp. Trol.Bus | „ 4 | 1,344 | 1,396 | + 52 | 26½ | 36,764 | + 1,980 |
| Isle of Thanet | „ 1 | 821 | 649 | — 172 | 39½ | 36,013 | — 4,400 |
| Kilmarnock Corp. | „ 4 | 525 | 505 | — 20 | 20½ | 10,036 | + 407 |
| Lancashire Un. | Sept. 28 | 2,394 | 2,151 | — 243 | 38½ | 82,525 | — 4,727 |
| „ Motor Buses | „ 28 | 5,074 | 5,176 | + 102 | 38½ | 192,816 | + 24,845 |
| Leeds Corporation | Oct. 4 | 19,906 | 20,286 | + 380 | 26½ | 535,641 | + 8,540 |
| Leicester Corp. | „ 4 | 8,794 | 8,656 | — 138 | 27 | 224,818 | + 170 |
| Lincoln Corp. | Sept. 14 | 966 | 1,002 | + 36 | 24 | 22,768 | + 76 |
| Liverpool Corp. | Oct. 4 | 27,728 | 27,028 | — 700 | 26½ | 720,343 | — 12,822 |
| „ Motor Buses | „ 4 | 2,936 | 3,208 | + 272 | 26½ | 88,972 | + 13,561 |
| „ Total | „ 4 | 30,664 | 30,236 | — 428 | 26½ | 809,315 | + 739 |
| London County Coun. | „ 8 | 84,973 | 84,406 | — 567 | 27½ | 2,256,993 | — 19,511 |
| Luton Corporation | „ 1 | 456 | 437 | — 19 | 26½ | 11,390 | + 270 |
| Maidstone Corp. | „ 2 | 270 | Nil | — 270 | 26½ | Nil | — 5,955 |
| „ Motor Buses | „ 2 | 415 | 326 | — 89 | 26½ | 7,496 | — 640 |
| „ Trolley Buses | „ 2 | 430 | 884 | + 454 | 26½ | 16,579 | + 8,262 |
| „ Total | „ 2 | 1,115 | 1,210 | + 95 | 26½ | 24,075 | + 1,667 |
| Manchester Corp. | Sept. 27 | 35,811 | 32,162 | — 3,649 | 26 | 828,422 | — 75,942 |
| „ Motor Buses | „ 27 | 4,915 | 9,002 | + 4,087 | 26 | 224,126 | + 94,454 |
| „ Total | „ 27 | 40,726 | 41,164 | + 438 | 26 | 1,052,548 | + 18,512 |
| Middlesbrough Corp. | „ 30 | 1,239 | 1,015 | — 224 | 26½ | 27,110 | — 2,829 |
| „ Motor Buses | „ 30 | 584 | 568 | — 16 | 26½ | 14,978 | + 1,163 |
| „ Total | „ 30 | 1,823 | 1,583 | — 240 | 26½ | 42,088 | — 1,666 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Wks. | Aggregate. 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Tv.Corp. | Oct. 4 | 10,373 | 8,617 | — 1,756 | 26½ | 231,894 | — 39,185 |
| „ Motor Buses | „ 4 | 2,097 | 3,604 | + 1,507 | 26½ | 85,341 | + 29,846 |
| „ Total | „ 4 | 12,470 | 12,221 | — 249 | 26½ | 317,235 | — 9,339 |
| Newport Corporation | Sept. 27 | 1,646 | 1,139 | — 507 | 26 | 38,659 | — 4,644 |
| „ Motor Buses | „ 27 | 760 | 1,322 | + 562 | 26 | 24,093 | + 4,396 |
| „ Total | „ 27 | 2,406 | 2,461 | + 55 | 26 | 62,752 | — 248 |
| Northampton Corp. | Oct. 3 | 1,160 | 752 | — 408 | 26½ | 27,675 | — 2,086 |
| „ Motor Buses | „ 3 | 792 | 1,052 | + 260 | 26½ | 21,223 | + 3,270 |
| „ Total | „ 3 | 1,952 | 1,804 | + 148 | 26½ | 48,898 | + 1,184 |
| Nottingham Corp. | „ 2 | 7,116 | 6,161 | — 955 | 26½ | 152,393 | — 23,628 |
| „ Motor Buses | „ 2 | 2,801 | 3,774 | + 973 | 26½ | 88,847 | + 27,567 |
| „ Trolley Buses | „ 2 | 635 | 1,234 | + 599 | 26½ | 31,789 | + 16,161 |
| „ Total | „ 2 | 10,552 | 11,169 | + 617 | 26½ | 273,029 | + 20,100 |
| Oldham Corporation | „ 4 | 3,701 | 3,424 | — 277 | 28 | 93,407 | — 6,039 |
| „ Motor Buses | „ 4 | 1,922 | 2,013 | + 91 | 28 | 55,663 | — 1,024 |
| „ Total | „ 4 | 5,623 | 5,437 | — 186 | 28 | 149,070 | — 7,063 |
| Plymouth Corp. | „ 4 | 3,784 | 3,745 | — 39 | 26⁵ | 100,122 | — 4,299 |
| „ Motor Buses | „ 4 | 2,058 | 2,652 | + 594 | 26½ | 66,983 | + 14,448 |
| „ Total | „ 4 | 5,842 | 6,397 | + 555 | 26½ | 167,105 | + 10,149 |
| Portsmouth Corp. | „ 4 | 4,179 | 4,027 | — 152 | 27 | 121,285 | — 11,342 |
| „ Motor Buses | „ 4 | 1,928 | 3,184 | + 1,256 | 27 | 94,320 | + 36,242 |
| „ Total | „ 4 | 6,107 | 7,211 | + 1,104 | 27 | 215,605 | + 24,900 |
| Preston Corporation | „ 1 | 1,748 | 1,681 | — 67 | 26½ | 44,124 | — 2,138 |
| „ Motor Buses | „ 1 | 531 | 511 | — 20 | 26½ | 13,710 | + 722 |
| „ Total | „ 1 | 2,279 | 2,192 | — 87 | 26½ | 57,834 | — 1,416 |
| Rawtenstall Corp. | „ 5 | 880 | 655 | — 225 | 26½ | 17,400 | — 5,304 |
| „ Motor Buses | „ 5 | 530 | 689 | + 159 | 26½ | 18,791 | + 4,657 |
| „ Total | „ 5 | 1,410 | 1,344 | — 66 | 26½ | 36,191 | — 647 |
| Reading Corporation | „ 2 | 1,598 | 1,460 | — 138 | 27 | 38,567 | — 1,928 |
| „ Motor Buses | „ 2 | 950 | 1,034 | + 84 | 27 | 27,047 | + 2,476 |
| „ Total | „ 2 | 2,548 | 2,494 | — 54 | 27 | 65,614 | + 548 |
| Rochdale Corp. | „ 4 | 2,812 | 2,801 | — 11 | ... | 74,121 | — 5,082 |
| „ Motor Buses | „ 4 | 1,575 | 1,619 | + 44 | — | 41,888 | — 704 |
| „ Total | „ 4 | 4,387 | 4,420 | + 33 | ... | 116,009 | — 5,786 |
| Rotherham Corp. | „ 6 | 2,871 | 2,834 | — 37 | 27 | 75,285 | + 1,983 |
| Salford Corporation | „ 5 | 11,460 | 11,108 | — 352 | 26½ | 299,645 | — 1,983 |
| Sheffield Corp. | „ 4 | 21,560 | 20,470 | — 1,090 | 25⅛ | 548,561 | — 18,094 |
| Southampton Corp. | „ 1 | 3,555 | 3,628 | + 73 | 27 | 93,814 | + 1,685 |
| „ Motor Buses | „ 1 | 866 | 924 | + 58 | 27 | 23,385 | + 2,628 |
| „ Total | „ 1 | 4,421 | 4,552 | + 131 | 27 | 117,199 | + 4,313 |
| Southend-on-Sea Corp. | „ 8 | 1,920 | 1,937 | + 17 | 27½ | 64,570 | — 3,425 |
| „ Trolley Buses | „ 8 | 218 | 274 | + 56 | 27½ | 9,313 | + 3,001 |
| „ Total | „ 8 | 2,138 | 2,211 | + 73 | 27½ | 73,883 | — 424 |
| Southport Corp. | „ 4 | 1,253 | 1,289 | + 36 | 26½ | 37,678 | — 812 |
| „ Motor Buses | „ 4 | 355 | 402 | + 47 | 26½ | 12,209 | + 1,026 |
| „ Total | „ 4 | 1,608 | 1,691 | + 83 | 26½ | 49,887 | + 214 |
| St. Helens Corp. | Sept. 30 | 2,008 | 2,039 | + 31 | 26 | 53,758 | + 2,746 |
| Sunderland Corp. | Oct. 7 | 2,477 | 2,128 | — 349 | 27 | 67,976 | + 266 |
| „ Motor Buses | „ 7 | 256 | 730 | + 474 | 27 | 16,263 | + 10,168 |
| „ Total | „ 7 | 2,733 | 2,858 | + 125 | 27 | 84,239 | + 10,434 |
| Swindon Corp. | „ 1 | 874 | 977 | + 103 | 26½ | 26,274 | + 5,063 |
| Wallasey Corp. | „ 4 | 1,288 | 1,168 | — 120 | 26½ | 34,148 | — 3,056 |
| „ Motor Buses | „ 4 | 1,983 | 2,202 | + 219 | 26½ | 65,916 | + 6,115 |
| „ Total | „ 4 | 3,271 | 3,370 | + 99 | 26½ | 100,064 | + 3,059 |
| Walsall Corporation | Sept. 28 | 3,564 | 3,479 | — 85 | 26 | 89,743 | + 1,057 |
| Walthamstow Corp. | Oct. 4 | 2,570 | 2,521 | — 49 | 26½ | 66,663 | — 423 |
| Warrington Corp. | „ 2 | 911 | 918 | + 7 | 27 | 23,904 | + 161 |
| „ Motor Buses | „ 2 | 478 | 505 | + 27 | 27 | 13,508 | + 1,508 |
| „ Total | „ 2 | 1,389 | 1,423 | + 34 | 27 | 37,412 | + 1,669 |
| West Ham Corp. | „ 2 | 6,494 | 6,132 | — 362 | 26½ | 159,843 | — 208 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses | Sept. 28 | 2,832 | 2,402 | — 430 | 26 | 63,908 | — 9,544 |
| „ Trolley Buses | „ 28 | 3,428 | 3,372 | — 56 | 26 | 90,274 | + 3,609 |
| „ Total | „ 28 | 6,260 | 5,774 | — 486 | 26 | 154,182 | — 5,935 |
| York Corporation | Oct. 1 | 1,156 | 1,038 | — 118 | 27 | 28,302 | — 449 |
| „ Motor Buses | „ 1 | 448 | 557 | + 109 | 27 | 13,800 | + 3,339 |
| „ Trolley Buses | „ 1 | 70 | Nil | — 70 | 27 | Nil | — 1,443 |
| „ Total | „ 1 | 1,674 | 1,595 | — 79 | 27 | 42,102 | + 1,447 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or M | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| | | £ | £ | | £ | £ |
| Anglo-Argentine | Oct. 7 | 91,178 | 82,204 | 40 w | 3,277,251 | — 169,890 |
| Brazilian Traction $ | Aug. | 4,333,460 | 3,792,808 | 8 m | 32,160,185 | — 546,195 |
| British Columbia $ | Aug. | 1,168,753 | 1,194,390 | 2 m | 2,390,629 | + 65,156 |
| Buenos Aires Lacroze | Oct. 5 | 11,836 | 11,541 | 14 w | 150,111 | — 11,615 |
| Burma E. Sup. Co. Rs. | Aug. | 61,309 | 66,418 | 12 m | 842,707 | — 11,962 |
| Calcutta ... Rs. | Oct. 4 | 129,965 | 106,914 | 39½ w | 4,416,870 | — 633,233 |
| Cape Town ... ... | Aug. | 27,636 | 24,090 | ... | ... | ... |
| Carthagena & Herrerias | Sept. | 660 | 437 | 9 m | 7,292 | — 1,458 |
| Durban Corporation | Aug. | 25,619 | 25,071 | 1 m | 25,071 | — 548 |
| East India ... ... | Sept. | 4,126 | 3,731 | 2 m | 7,679 | — 599 |
| Kalgoorlie ... ... | July | 1,664 | 1,776 | 7 m | 11,662 | + 137 |
| Madras (2 weeks) Rs. | Sept. 30 | 38,594 | 43,339 | 38 w | 836,526 | + 45,843 |
| Para ... ... | Aug. | 15,224 | 12,681 | 9 m | 131,304 | — 2,022 |
| Port Elizabeth ... | Aug. | 7,402 | 6,955 | ... | ... | ... |
| Rangoon ... Rs. | Sept. | 122,850 | 147,775 | 9 m | 1,345,030 | + 267,189 |
| Shanghai ... $ | Sept. | 365,828 | 418,059 | 9 m | 3,097,758 | + 101,709 |
| Singapore ... ... $ | Aug. | 130,000 | 142,000 | 11 m | 1,510,000 | + 165,000 |
| Winnipeg ... . $ | Aug. | 494,642 | 445,908 | 8 m | 4,171,624 | — 161,031 |

## RAILWAY RECEIPTS.

| 40th Week ended Oct. 5th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 226,000 | — 6,000 | 338,000 | — 13,000 | 564,000 | — 19,000 | —1,103,000 |
| L.M.S.R. | 530,000 | — 33,000 | 779,000 | — 114,000 | 1,309,000 | — 147,000 | —3,706,000 |
| L.N.E.R. | 357,000 | — 24,000 | 655,000 | — 63,000 | 1,012,000 | — 87,000 | —2,463,000 |
| S.R. | 303,000 | — 12,000 | 109,000 | — 1,000 | 412,000 | — 13,000 | — 474,000 |
| Totals | 1,416,000 | — 75,000 | 1,881,000 | — 191,000 | 3,297,000 | — 266,000 | —7,746,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Oct. 4 | 299,900 | 310,100 | + 10,200 | 12,040,900 | + 627,800 |
| Lond. & Sub. Group | „ 4 | 45,200 | 46,100 | + 900 | 1,773,700 | + 99,700 |
| Metropolitan Railway | „ 4 | 37,500 | 35,900 | — 1,600 | 1,462,500 | + 17,200 |
| Liverpool Overhead | „ 5 | 1,636 | 1,428 | — 208 | 63,324 | — 4,843 |
| Mersey Railway ... | „ 4 | 4,936 | 4,945 | + 9 | 181,328 | + 4,050 |

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THE Tramway & Railway World
WITH OMNIBUS & COACH SECTION
Founded 1892 LONDON, OCTOBER 16, 1930 VOL. LXVIII

# MELBOURNE'S NEW TRAMCARS

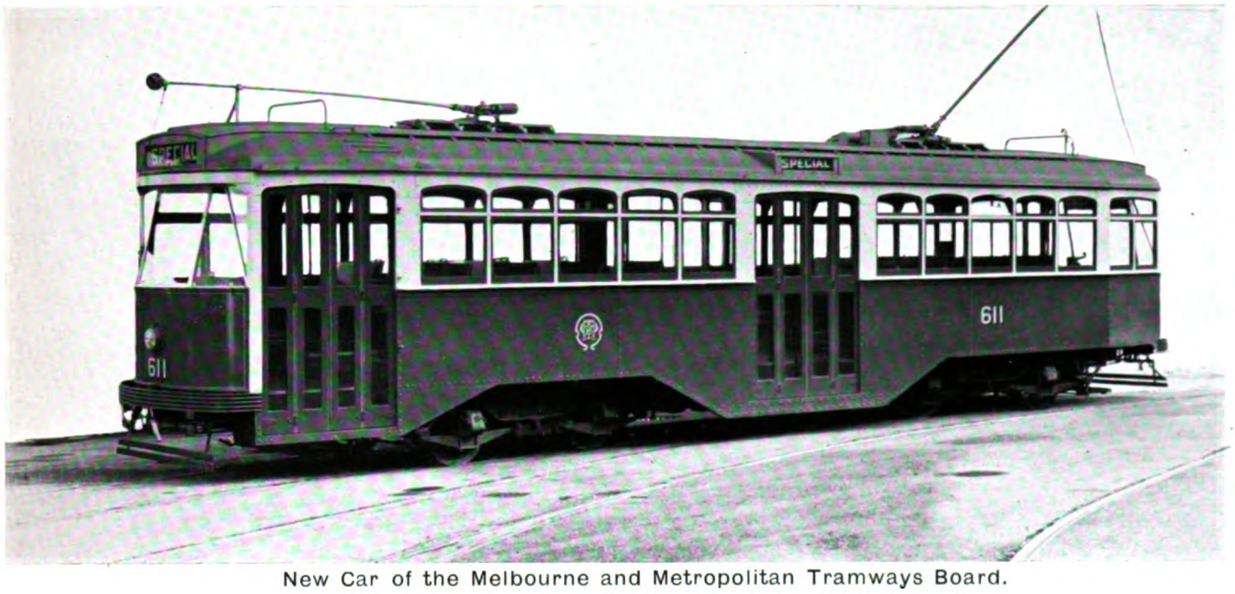
FULL ELECTRO-PNEUMATIC CONTROL, VARIABLE LOAD BRAKES, AND SPECIAL TRUCKS.

A number of new alternative one- or two-man tramcars with many novel features are being placed in service by the Melbourne and Metropolitan Tramways Board, Victoria, Australia. These cars have been designed and built under the supervision of the chief engineer, Mr. T. P. Strickland, M.I.E.E., and his staff, at the local tramway workshops.

The overleaf drawing illustrates the general elevation and plan of the car mounted on the new trucks. The car is 45 ft. long, 8 ft. 4 in. wide, 10 ft. 2 in. high from rail to roof, and weighs 18 tons 17 cwt. 3 qrs. The seating capacity is 49 or 53, and the crush load capacity 128. Each of the centre doors opens to a width of 5 ft. and those at the ends to 4 ft., both measurements being wider than usual. Anti-climbing bumpers are fitted to reduce the risk of telescoping in collision. Extensive use is made of electric welding in joining the members.

Ample ventilation is provided by raising the centre section of the roof throughout its length, so as to leave longitudinal slots, and by constructing the top section of each window so that it makes a hinged fanlight which can be dropped back at an angle inside the car. The lower portion of the window drops to the full depth, and louvred sun blinds are provided, a necessary fitting in a city which enjoys an average of six hours sunshine daily throughout the year. In order to obviate the danger of dazzle obscuring his view of the road, the motorman's windscreens are sloped at such an angle that the reflections of lights inside the car at night will be thrown down out of the driver's line of vision. The motorman is provided with a seat.

In the seating accommodation, shown in the view of the interior of the car, special attention has been paid to the passengers' comfort. Cross seats with reversible backs are used in the body of the car, and there are short side seats near the centre doors, and near the ends opposite the end doors. In addition, there are folding seats which may be dropped in front of the centre doors when these doors are not in use. The centre aisle is 2 ft. 4 in. wide.



New Car of the Melbourne and Metropolitan Tramways Board.

The car-body framework is constructed entirely of steel, the posts and other members being of structural steel sections, and the panels and letter boards of sheet steel. While every effort has been made to reduce weight, particular attention has been given to the provision of the strength necessary to withstand the severe requirements of high-speed electric car operation, while special care has been taken to facilitate the work of maintenance.

Side sills are of 3½ in. by 3½ in. by 5/16 in. angle, and end sills of 7 in. by 2½ in. by 9·75 lb. channel. Cross-members are 3 in. by 1½ in. by 4·6 lb. channel on the end platforms, and 4 in. by 2 in. by 7.96 lb. channel on the centre platform. Bolsters are of the box girder type with 10 in. by ½ in. top and bottom plates, 6 in.

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by $\frac{1}{4}$ in. webs strengthened with ribs, and all held together by electric welding. The body frame has belt rail 3 in. by $1\frac{1}{2}$ in. by 5/16 in. angle, $1\frac{1}{2}$ in. by $1\frac{1}{2}$ in. by 3/16 in. tee steel posts and top plate of 3 in. by 2 in. by $\frac{1}{4}$ in. angle. Panels are 14 gauge and letter boards 16 gauge sheet steel. The window sill is of wood, and the posts have wood fillers.

The roof is of $\frac{1}{4}$ in. plywood covered with Caledonian roof covering, and the carlines are of $1\frac{1}{4}$ in. by $1\frac{1}{4}$ in. by 3/16 in. tee steel fitted with wood furring sawn to shape. T. and G. Baltic pine of $\frac{5}{8}$-in. thickness forms the flooring, which is covered with brown linoleum edged with small aluminium angle finishing pieces.

Interior of New Melbourne Tramcar.

Polished plate-glass of 3/16 in. thickness forms the end windscreens, while the side windows are $\frac{1}{8}$ in. thick. The sashes and louvred blinds are made to run in extruded brass sections, screwed to the pillars to form the sash guides. The doors, 1 in. thick, with $\frac{1}{4}$ in. polished plate-glass, are of the double two-part folding type and fold into the step well. Door engines controlled by the motorman operate all doors.

Transverse seats of the reversible type have aluminium frames with spring cushions and backs, upholstered in brown leather. Tasmanian blackwood, a nicely figured timber, has been used for the interior finish of the car. Outside, the car has been finished in green and cream cellulose lacquer, sprayed on and polished.

In order to allow the use of 33 in. diameter wheels in the trucks the step heights have been graduated, the height from the rail to the step well being $15\frac{1}{4}$ in. and from the step well to the floor of the car $13\frac{1}{2}$ in. The remaining height to clear the 33 in. wheels is obtained by raising the vestibule aisle $5\frac{1}{4}$ in., and the seat platform 4 in.

### Mechanical Equipment.

Mounted on trucks of a modern type designed by the Board's officers, the cars have cast steel side-frames and clasp brakes, and are fitted with long semi-elliptic springs rigidly attached to the axle boxes and joined to the side-frames at the ends by means of shackles. Each truck is equipped with two 40 H.P. Metropolitan-Vickers motors, made in Australia. The free running speed of the motors is 28 M.P.H., and the gear ratio 13/77. On test these trucks have been found to possess very easy riding qualities.

The car controllers are of the G.E. series-parallel type with dead man's handle, and were made in Australia. The brake and door control is electro-pneumatic throughout, and includes an E.P. valve operating a quick application and release valve adjacent to the brake cylinder. The equipment includes also a variable load valve which automatically adjusts the pressure in the brake cylinder to correspond with the load on the car. The electro-pneumatic controllers and variable load brake valve were supplied by the Westinghouse Brake and Saxby Signal Company and the door-operating equipment by G. D. Peters & Co., London.

Special attention has been paid to the lighting of these cars, and a soft and pleasing effect is obtained by

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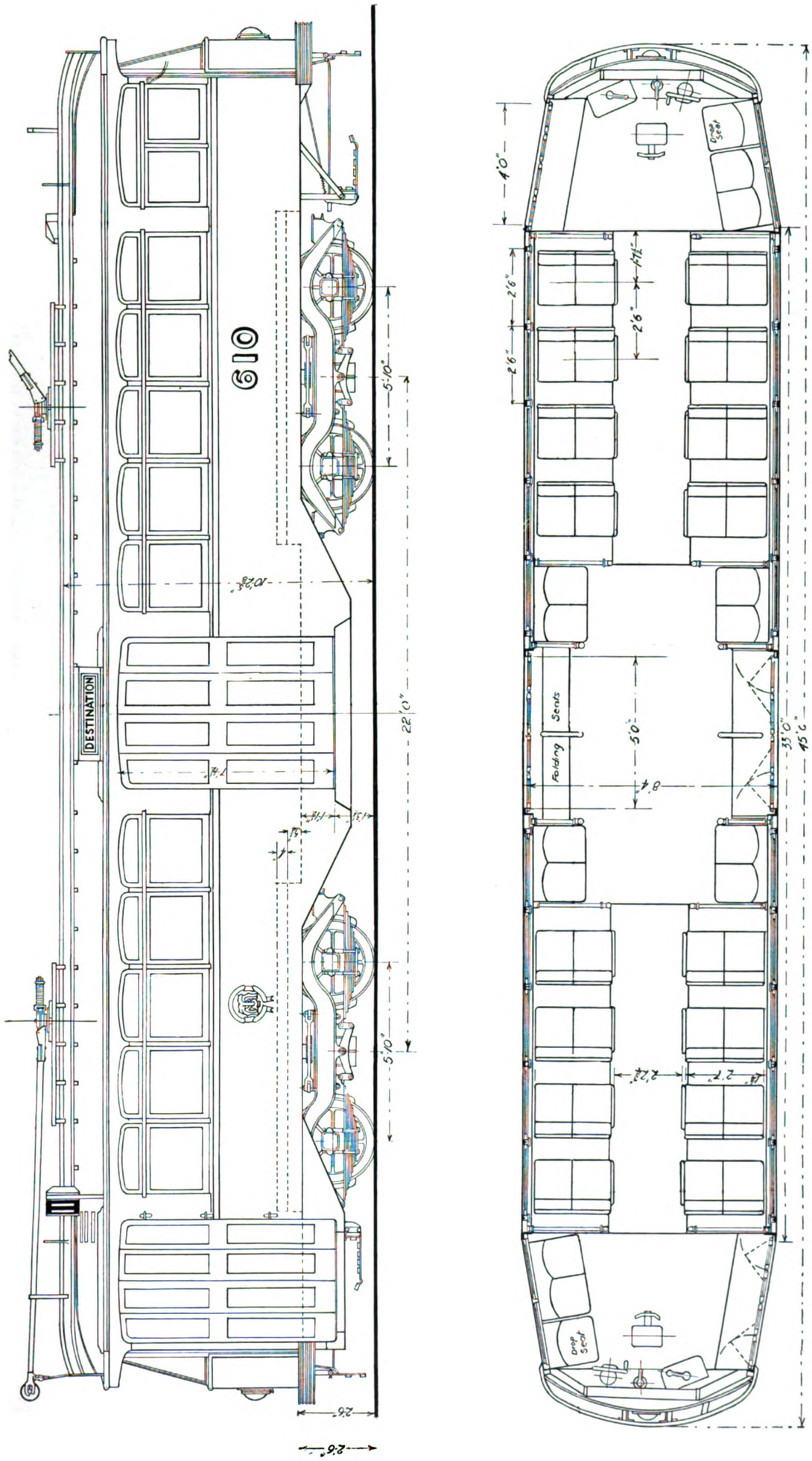


Elevation and Plan of the New Car of the Melbourne and Metropolitan Tramways Board, Victoria.

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the use of suitable shades. It has been realised that the conditions of modern service require that increased attention be paid to the comfort of passengers, and the comfortable seating, attractive lighting and easy riding qualities should appeal to patrons. In addition, the cars are handsome in both internal and external appearance, and should prove a great asset to the undertaking. If they fulfil, in service, the expectations of their designers, the Board intends to proceed immediately with the construction of more. The principal dimensions of the car are as follow :—

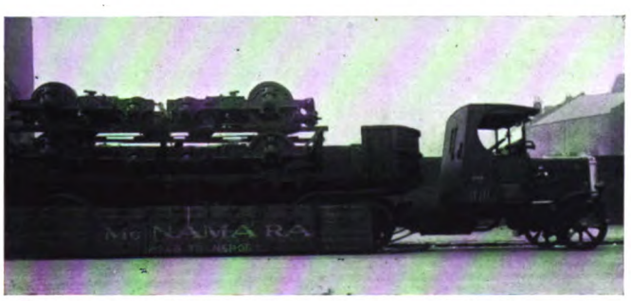
| | ft. | in. |
|---|---|---|
| Length over bumpers .. .. .. .. | 45 | 0 |
| Width of car at belt rail .. .. .. | 8 | 4 |
| Height, rail to floor at centre .. .. .. | 2 | 4¾ |
| ,, rail to step .. .. .. .. | 1 | 3¼ |
| ,, step to platform at centre .. .. | 1 | 1½ |
| Truck centres .. .. .. .. .. | 22 | 0 |
| Truck wheel-base .. .. .. .. .. | 5 | 10 |
| Size of wheels .. .. .. .. .. | 0 | 33 |
| Seating capacity .. .. .. .. .. | 49 to 53 | |
| Crush load capacity .. .. .. .. | 128 | |

Mr. Alex. Cameron, chairman of the Tramways Board, states that the success of the experiment with this type of car depends largely upon the ability of the passengers to adapt themselves to the new conditions of loading and unloading. It was recognised that some such tramcar, giving ample shade and ventilation in summer and protection from winter winds, offered the best chance of attracting additional custom.

## DELIVERING TRAMCAR TRUCKS.

The packing and delivery of tramcar trucks from works to destination is a matter that requires careful preparation in order to ensure their safe and speedy delivery. A unique method has been adopted by the Electro Mechanical Brake Co., Ltd., for transporting from their works at West Bromwich to London, trucks made for the London County Council tramways.

In planning the arrangement it was necessary to ensure that the supporting structure could be easily dismantled and packed into a small space for the return journey. A framework of channel iron, rigidly braced together and bolted to the lorry, admirably fulfils these conditions and enables the two sets of trucks weighing




Transporting Tramcar Trucks for L.C.C. Tramways.

10 tons to be carried one above the other, the wheels of the lower set helping to support the upper trucks. Scotches bolted on the channels effectively prevent any movement and make certain that the trucks do not touch each other.

That the scheme is a success is proved by the fact that 182 trucks have already been delivered to the L.C.C. in this way without any trouble whatever. The advantages are that the trucks are only handled twice and the quick transport ensures that trucks loaded in West Bromwich at night are delivered in London early the following morning.

## PONTYPRIDD'S NEW TROLLEYBUS ROUTE.

### Why Tramways have been Superseded.

A new fleet of trolleybuses, which replaces tramways over a distance of 3·3 miles, from Cilfynydd terminus to Treforest, was inaugurated by the Pontypridd Urban Council on September 18. This is the main line of the Pontypridd system. A branch track runs to Trehafod, where it joins the Rhondda tramways, and is jointly operated by the Rhondda Tramways Co. and the Pontypridd Council. The Rhondda Tramways Co. are considering the conversion of their system to trolleybuses, and if this is decided upon the Trehafod section

Trolley Omnibus Crossing a Bridge at Pontypridd.

will also be converted, as it has been deemed advisable to postpone this until the trolleybuses can be continued into Rhondda.

The tramways, which were constructed in 1905, were timed to do the journey from Cilfynydd to Treforest and back in one hour, but the time for the trolleybuses has been cut down to 48 minutes. The average speed of the tramcars was 6·6 miles per hour; that for the trolleybuses is 8·8, an increase on the schedule speed of 33⅓ per cent.

### Tramway Difficulties.

Mr. J. E. Teasdel, M.I.E.E., general manager of the Pontypridd Council's Transport Department, has supplied us with a statement of reasons why the Council decided to abandon tramways in favour of trolleybuses, in the course of which he says :—

" Even though the tramways department has (with the exception of the year of the general strike) always been able to show a gross operating profit, there has been difficulty in providing for the interest charges and repayment of loans. There were several reasons for this, all entirely beyond the control of the department. Tramways have to operate under statutory conditions which place them at a serious disadvantage when compared with other forms of transport. We have for several years had to maintain roads over which our competitors' vehicles were running ; also, our operating costs went up considerably because, as we were operating in a mining area, the maintenance of our permanent way proved abnormally expensive as a result of land subsidence. When, on top of these disturbing features the Council was faced with the crippling effect

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of acute local trade depression, it was at once realised that something had to be done.

"After considering the matter very carefully, hearing the opinion and receiving a report on our undertaking from one of the greatest transport authorities in the country, the late Mr. Alfred Baker, formerly general manager of the Birmingham Corporation Tramways Department, and also sending a sub-committee to visit a number of towns in different parts of the country, the Council decided to convert the tramways system to one of railless trolley vehicles.

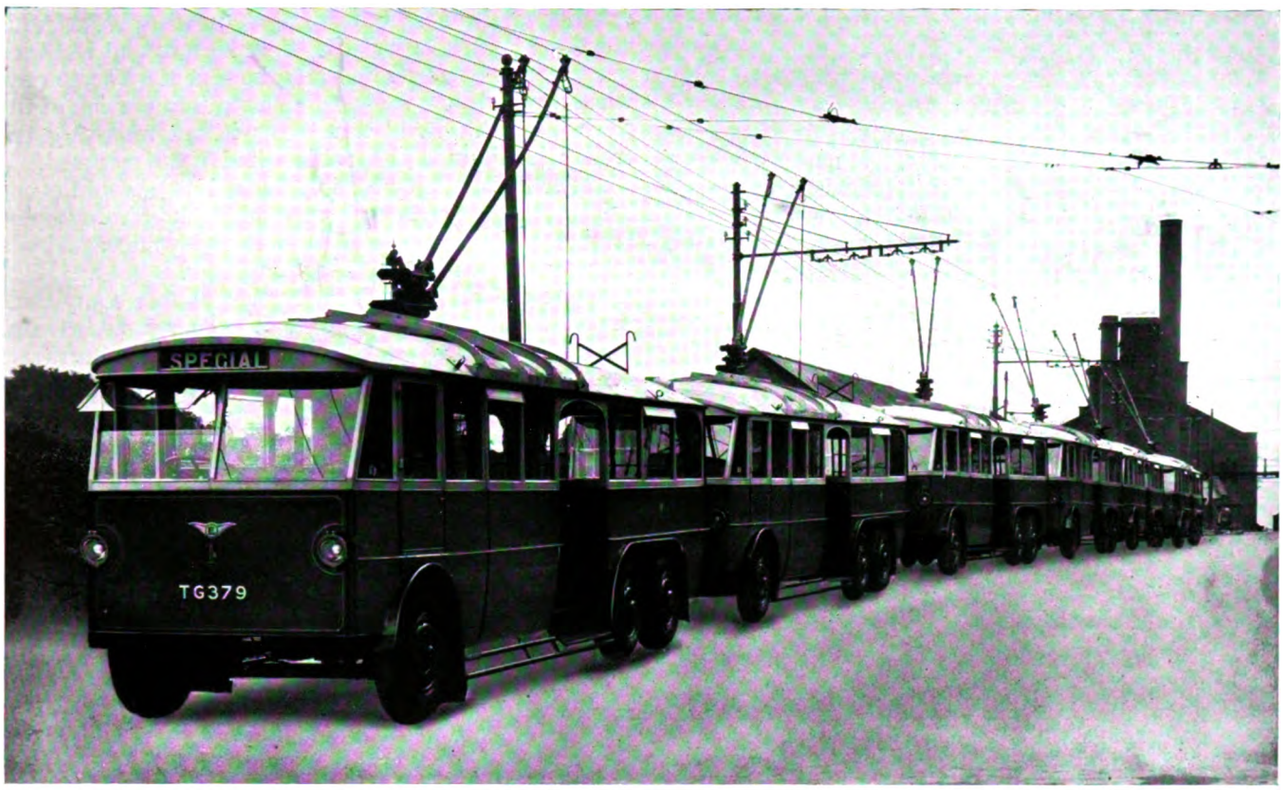
### Advantages of the Trolleybus.

"One advantage of the tramways was that as they drew their power from a central station, the power costs were low. (Our power station is owned by the town, and the tramway load has helped to preserve for the station an economic load factor which has resulted in reductions to electricity users.) The advantage of the petrol omnibus lies in its flexibility, its ability to work through traffic, to use any part of the road, and to take up and set down passengers near the pavement. The trolleybus combines the merits of the two systems. Its flexibility is limited only by the length of the boom connecting it to the two overhead wires. Not only can it work its way through the traffic, but it is also possible for one vehicle to pass another which may have broken down, and thus obviate holding up the whole system.

"It is, of course, conceded that the trolleybus cannot be put on a route where there are no overhead wires, but in Pontypridd even this point is discounted by the fact that the nature of public transport is such that the vehicles must of necessity adhere to the defined and regular route. Again, trolleybuses have lower running costs than petrol omnibuses, and their working life is longer. They are easily manipulated, and the absence of gear-boxes gives quick, silent acceleration and deceleration—without fumes—and a high average speed. Powerful hand and compressed air brakes provide the most effective and efficient braking known. So effective are these brakes that it has already been found necessary to issue warnings for the benefit of drivers of vehicles following a trolleybus."

### The Vehicles.

The vehicles were supplied by the English Electric Co., Ltd., and were manufactured at their Preston works. Each trolleybus, which is of the six-wheel type, has seating accommodation for 32 passengers, and has an overall length of 27 ft. 6 in. and a wheelbase of 17 ft. The body is fitted with a centre entrance. The seats are upholstered and are provided with easily detachable covers, which are slipped over the normal upholstery when workmen are travelling to and from their work.




A Fleet of Trolleybuses at Pontypridd.

The chassis has pressed steel side-frames braced with suitable transoms, and is provided at intervals with outrigger brackets for supporting the body. The drive is designed to eliminate wheel slip, and to reduce to a minimum the strain on the driving gear. It is transmitted to the two rear axles through a cardan shaft and three differentials; this arrangement gives a differential drive between the two wheels of each axle and between the two axles themselves. A double swivelling point is provided for the rear bogie in order to correct any tendency to tilt when braking; this construction also equalises the adhesion of the wheels and thereby renders braking more efficient, and relieves the springs of undue stresses.

Two separate brakes are provided, for hand and foot operation respectively, and they control three different braking systems. The hand brake consists of an ordinary lever which applies the brakes to the four

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rear wheels. The foot pedal serves two functions; its initial depression applies electric rheostatic braking through two brake positions, and further depression, whilst retaining rheostatic braking, applies air brakes on all six wheels, the air brake applying different shoes on the rear wheels from those applied by the hand brake. The motor is a 500 volt 60 H.P. self-ventilated inter-pole machine, and its control equipment comprises a master switch, a reverser,

A Trolleybus Rounding a Sharp Corner at Pontypridd.

contactor and current limit panels, and brake switch.

The master switch is of the drum type; it controls the operation of the contactors and ensures that they open and close in correct sequence. The contactors are built up of interchangeable parts and have substantial adjustable contact fingers provided with renewable tips, thereby rendering maintenance a very simple matter. Auxiliary contacts are also fitted, but as the current carried by the contactors is quite small, the arc set up when breaking circuit is negligible. Included in the case of the contactor group is a current limit relay, which automatically regulates the acceleration and safeguards the motor from being severely overloaded. The vehicles are provided with convenient bells of the "Numa" type, a speedometer and emergency lighting in case the trolley voltage fails.

### The Overhead Equipment.

The overhead construction was carried out by Clough, Smith & Co., Ltd., of Victoria Street, London, who have already carried out the complete conversion of the tramway systems for trolleybus operation at Keighley, Darlington, Chesterfield and Doncaster. All old poles at curves and termini, were replaced by weldless steel stepped poles of the British Mannesman Company's manufacture, and only old poles on straight portions of the road were retained. The whole of the wiring was removed and replaced with new material throughout. Line fittings specially designed to take the weight and strain of the four new trolley wires were provided. The section insulators, negative sections and insulated crossings were of the contractors' own designs, and fitted with non-hammering ends, to ensure against crystallisation at the points where the trolley wire ends. At the Treforest end, owing to the restricted width of the road, an automatic overhead reverser for the trolleybuses was provided. At the Cilfynydd terminus, however, the roadway was of sufficient width to provide an overhead turning circle. Cadmium trolley wire of round gauge was used throughout, grooved trolley wire being avoided, as the contractors have found from experience that, owing to the reduced wearing surface on the side of the wire, it has a much shorter life than trolley wire of circular section. The guard wire was erected more than 3 ft. above the level of the trolley wire, in place of the minimum of 2 ft. called for by the Ministry of Transport.

The trolley wires were erected in such positions as to ensure the vehicles being able to deviate with equal freedom in either direction and to allow them to operate at their maximum speed around curves of large radius. Considerable care was exercised in the layout of the overhead equipment, and special route plans were prepared and agreed with the general manager before the work was put in hand, and in addition enlargement plans were prepared of special work. The vehicles are fitted with the twin type of trolley standard, *i.e.*, one standard superimposed upon another and operating from a centre pivot. This standard is of Estler Bros.' manufacture and its flexibility was demonstrated at the opening ceremony, when a vehicle was reversed on a straight portion of the route near Cilfynydd terminus without removing the trolley head until the vehicle had been reversed.

Much human interest is attached to the old stone bridge shown at the left of one of our photographs. It was designed and built about 150 years ago by a stonemason who acted as engineer. At the first attempt the bridge collapsed when almost completed, the abutments being too light. On the second attempt it again gave way nearing completion, the abutments being too heavy. These were then lightened at the suggestion of the mason's wife, two culverts being cut through the abutments on each side of the bridge. The third attempt was successful, and the bridge, said to be the longest span of any stone bridge in the country, is still sound, although in disuse.

## KINGSWAY TUNNEL ENLARGEMENT.

### Difficult Work Approaching Completion.

The enlarged tramway subway of the London County Council Tramways between Victoria Embankment and Southampton Row, via Kingsway, will, it is hoped, be ready for reopening before Christmas. The work of reconstruction has been carried out under difficult conditions, but in much less time than was specified in the contract, which was entered into in 1929 with John Cochrane & Sons, of Westminster. The original subway, which was opened for traffic in 1908, provided for single-deck cars only. As reconstructed the tunnel will take double-deck cars. The subway was closed for enlargement on February 3, 1930. As was stated in an illustrated article in The Tramway and Railway World of February 13 last, the work consists of raising the roof and lowering the floor of the tunnel according to the conditions demanded by the grading of the new rail level. Under the Strand and Holborn crossings, the old subway was carried in twin cast-iron lined tunnels. At the Strand crossing, the upper half of each tunnel now forms the roof of new passages. Additional headroom has been obtained by breaking away the lower halves of the old tunnel and sinking the rail level about six feet. At the Holborn crossing, the old cast-iron tunnels have been removed, and the new subway is carried within a framework of steel pillars supporting the steel roof, which is just below the street level.

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## THE PASSING OF THE BLACK COUNTRY TRAMWAYS.

[By a Correspondent.]

The Black Country, once famous for its sudden subsidences, has recently been the scene of the disappearance of an entire tramway system. Twenty years ago the Black Country tramways, belonging to the old British Electric Tramway Co., consisted of over 100 miles of track and over 200 cars, which were housed in eleven depots. In addition there was a large central repair shop at Tividale and several tramway power stations. The system interconnected Birmingham, West Bromwich, Wednesbury, Walsall, Wolverhampton, Dudley, Stourbridge, Darlaston, Bilston and other Black Country towns. A portion of it was leased from municipalities. These extensive lines came up for purchase, or the leases fell in, on any number of varying dates, the latest of which was December 31, 1938.

With a view to the proper maintenance and reconstruction of the entire system, the companies concerned sought, by the Black Country Tramways & Light Railways Act, 1922, to consolidate all these varying tenures and to extend them to the latest term of the series. They also sought to confer upon the local authorities concerned, if they should wish to exercise it, power to purchase and operate the entire system through a joint board. This latter proposition, however, met with strange and strenuous opposition. In regard to the proposed consolidation of tenure and the extension of all the dates to December 31, 1938, this, though well-supported in some districts was opposed in others. The final upshot was that the important lines leased from the Corporation of West Bromwich were taken over by that Corporation at the earliest possible date, namely, April 1924, and, in addition, certain other local authorities refused to postpone their rights of purchase, so that by the time the Bill became law its value as an encouragement to the tramway companies to spend large sums of money on reconstruction and modernisation, approximated zero. The eyes of the business now began to be picked out, and the hitherto co-ordinated and coherent systems of tramways began to fall into disconnected pieces.

Just about the same time motor omnibus competition commenced and the weaker portions of the tramway system were soon reduced to a non-paying condition. Fortunately, the parent company possessed an allied motor-omnibus undertaking, which had hitherto only been operating such Black Country routes as were not served by the tramways. These omnibuses were now obliged to come on to the tramway lines to try and drive off the "pirate" omnibuses. Fortunately, those responsible for the management of the companies had shown foresight in the past, and by opposing various Bills for the development of municipal transport enterprise had obtained fair and proper protection for their adjacent tramways from the incursion of municipal omnibuses. Wherever the municipalities, armed with motor omnibus powers, sought to expand outside their territory, they were placed under an obligation to buy out the tramways.

Long leases with onerous liabilities had been entered into, the obligations of which would have been an intolerable burden if the lessees were denied access to the large adjacent towns owing to the pulling up of the tramways and, on the other hand, if, *per contra*, the contemplated omnibus services of the big municipalities were allowed to spread themselves over the tramway routes of the smaller towns. In some cases lessors, notwithstanding their covenant to give their lessees quiet enjoyment, granted omnibus licences to all and sundry, rendering it impossible for their lessees to earn the rent they had stipulated to pay.

The inevitable result of all these forces pulling in all directions was the rapid dissolution of the Black Country tramway system. On Tuesday night, September 30, the last group of company-operated tramway lines in the Black Country, namely, those in and about Wednesbury, were taken over by the Walsall and West Bromwich Corporations respectively, and the only tramway line now left out of the whole of the old Black Country system is the line which runs from the Smethwick-Birmingham boundary through Smethwick and Oldbury to the railway station at Dudley with a branch line to Bearwood (Smethwick). This line, which comprises some 13½ track miles, is, however, not operated by the company, but by the Birmingham Corporation on behalf of the company.

Of the remaining lines of the system, some have been purchased by Wolverhampton and West Bromwich for conversion to motor omnibus or trolleybus routes; others have been abandoned and pulled up, and motor omnibuses belonging to the Birmingham & Midland Motor Omnibus Co. have taken over the services previously given by the tramcars.

Thus, in a space of a little more than five years, a once large and reasonably prosperous tramway system has, to all intents and purposes, been wiped out, and many of the still-operated transferred tramways will certainly not be reconstructed when the date for their reconstruction arrives.

Investors who put money into this system of tramways have recovered only a small fraction of it by way of purchase price and from the sale of the scrap. The employees have probably suffered least of all, although some of these, owing to age, have not been able to find jobs with the adjacent municipalities or on the motor omnibuses. By far the greater number, however, have been taken over by other transport undertakings, and so this rapid disappearance of one system of road transport and this rapid rise of another has not visibly swollen the numbers of the unemployed.

## FUTURE OF AUSTRALIAN TRAMWAYS.

In his presidential address at the conference of Australian tramway authorities held at Brisbane, Mr. A. Cameron, chairman of the Melbourne Tramways Board, said it was time tramways began to hit back at the unjustified abuse from an ill-informed public and the flagrant misrepresentations of powerful bodies with opposing interests. Lack of consultation between the various forms of transport had led to unremunerative fares, the needless duplication of facilities, and competition for the waiting passenger. For this state of affairs the suggested remedy was the formation of a Ministry of Transport. Such a ministry, free from political influence and staffed with men with knowledge and experience with power to do their jobs, would, however, be admirable. In any case tramways would have a prominent share in city transport schemes for many years. There was no vehicle in sight which could compare with the tramcar under peak load conditions, and speedier and more comfortable cars were regaining traffic both in Great Britain and America.

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The Editor will consider contributions offered for publication in THE TRAMWAY AND RAILWAY WORLD (including the Omnibus and Coach Section) by those conversant with the subjects that come within the scope of this journal. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, OCTOBER 16, 1930.

**London Traffic Co-ordination.**

At long last we are promised a serious attempt by a Government to solve the problem of London passenger traffic—to bring order out of chaos, to produce co-ordination, and to eliminate wasteful competition. The slightly nebulous scheme which Mr. Herbert Morrison (Minister of Transport) has made public seems to be satisfactory as far as it goes, but everything will depend on the details. A Traffic Board for the whole of Greater London has been the dream of almost innumerable Commissions and Committees for many years, but nothing definite has been done. Local jealousies, political jealousies, and particularly the municipal mania, have sicklied o'er the great central principle. It is accordingly gratifying to find that Mr. Morrison has definitely abandoned the idea of a municipal authority. No doubt when he came down to the bed-rock of facts he saw how impossible the municipal idea is in the case of London. He has come back to the proposal of various bodies which have examined the subject—namely, that there should be a Traffic Board, completely free from all political and municipal bias, a Board of experts and business men devoted entirely to a business issue. The scheme is vast, much vaster than that put forward in combination by the London underground railway companies and the London County Council which was rejected by Parliament on the recommendation of Mr. Morrison. That scheme went as far as the promoters of a private Bill could go, but if it had been carried out it would have formed a basis for developments such as are to be seen in this Government scheme. Still the essentials are the same—a common management, a common fund, co-ordination, and the avoidance of wasteful competition. The greatest capital liability in the proposed combine is that of the Underground Railway group. The idea of bringing them under municipal ownership and management was always fantastic, especially when the number of local authorities concerned is considered. In view of the number of interests concerned, the Government will have to give preference to their proposed Bill if it is to be passed. The capital involved in the undertakings is considerably over £100,000,000. This the proposed Traffic Board will have to take over and to issue stock, presumably as a trustee security, in place thereof. The Underground Railway Companies, the London General Omnibus Company, the London County Council as a tramway authority, and various other transport bodies will have to disappear. Truly the task is a formidable one, but it should not be longer delayed.

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**Municipal Transport Expansion.**

The Municipal Tramways and Transport Association whose important conference at Harrogate is fully reported in this issue, may, as an Association, view the gradual supersession of tramways that is taking place in the smaller towns with equanimity. By the addition of "transport" to its title in 1925 the Association thereby brought within its scope any form of passenger transit operated by local authorities. Men with vision have always constituted its council, and they have had the good fortune to be served by a general secretary and a small staff that have worked wonders with the means at their disposal. There could be no greater test of the utility and practical service of the Association than the record attendance that marked the Harrogate conference, when ninety-eight of the 103 authorities who are members of the Association sent delegates to this annual event. There is good ground for believing that

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transport committees and their managers foresee an increasing necessity for the Association's service and the extension of its activities in technical and general matters. Particularly will attention need to be paid to the administration of the Road Traffic Act. This measure has plunged all transport authorities upon uncharted seas. The operation of Part V, which gives powers to local authorities to run omnibuses with some approach to the freedom enjoyed by private owners, will need careful watching by the municipal operators themselves and by the Association. Then, too, there is something more than appears on the surface in the fact that a local authority will, with the sanction of the Minister of Transport, be able to extend its omnibus routes without incurring heavy expenditure on a Parliamentary application. As was suggested by the Royal Commission on Transport, this facility may further enable a council to substitute omnibus services for tramways if they consider it to be in the public interest so to do. At present abandonment has to be sanctioned by an application to Parliament. Why not by an application to the Ministry of Transport? A precedent for that course is to be found in the local hearing by the Light Railway Commission of applications for the construction of tramways under the Light Railway Act. This is a matter which the Association should bear in mind in the action that should be taken in the near future to remedy by Parliamentary action the financial injustices inflicted by the Tramways Act.

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**British Trolleybus Manufacturers' Lead.**

For the improvements made in the trolleybus during the last few years credit is due to British manufacturers. They now lead the world in the production of a vehicle which is silent and speedy, is as comfortable and smooth running as any modern public passenger vehicle, is easy to handle, and has many other advantages which have made it successful in dealing with passenger traffic under certain conditions. Much of its increased comfort of course is due to the adoption of the air tyre, and while it has proved acceptable to the public it is also an economic proposition. English municipalities are also leading the world by the adoption of the system, as is shown by the fact that in the last Parliamentary session twenty authorities received powers to convert their tramways to trolleybuses and that over twenty are now preparing Bills with the same object. Developments are being watched with interest by overseas countries, and delegations from numerous towns on the Continent and elsewhere have in recent months inspected and investigated the installations at such places as Wolverhampton, Bradford, Hastings, Nottingham and Keighley. So far the use of the trolleybus overseas is very limited; but in the United States there are signs of reviving popularity following early failures when the industry was in its infancy. In South Africa there is an installation at Bloemfontein, and the system is likely to be adopted in several other towns. As the system develops, which seems likely, English manufacturers of vehicles and equipment, with the experience of many successful installations behind them, will reap the advantage.

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**The Harrogate Conference.**

The least satisfactory feature of a very successful Conference was the discussion on Councillor Gledhill's paper on the transition in road passenger transport, with special reference to the changes that have taken place between 1928-1930. The debate on this notable paper was confined mainly to the old theme of tramcar *versus* omnibus, Mr. Stuart Pilcher leading off with a reference to his latest Manchester substitution scheme. That circumstance does not, however, stamp him as being anti-tramway. No doubt he was anxious that the conference should learn that the two scrapping projects which he has recommended this year are unavoidable. What almost all the speakers failed to realize was that the paper was replete with topics for far more useful discussion. These included the licensing position under the Road Traffic Act, the joint working agreements with the railway companies, accounts and statistical records, depreciation, repairs and maintenance, tyre costs and maintenance, omnibus mileage and speed per hour, standard costs and municipal omnibus stations. Then there was the author's eminently wise reference to the position to which many tramways undertakings have been brought by the

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practically unrestricted competition from omnibuses, which are free from the legal burdens placed upon tramways. Councillor Gledhill rightly drew attention to one or two facts that would result from abolition of tramways at an inappropriate time. Capital amounting to millions of pounds of the ratepayer's money would be lost, thus creating a serious position for the travelling public, particularly at work-people's hours. Deprived of the charges imposed on the tramways, the ratepayers would have to meet greatly increased highway expenditure. By reason of his prominent association with three professional organisations, as well as his long connection with Halifax Tramways Committee, Councillor Gledhill's other suggestions already enumerated should command attention from the Council of the Association. His ideas carried into effect should render the industry better able to tackle the difficult problems that beset it to-day.

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**Municipalities and Road Traffic Act.**

From a general point of view perhaps one of the most interesting parts of Alderman Canby's presidential address at the conference of the Municipal Tramways and Transport Association was that relating to the Road Traffic Act, which is about to come into force. The president indeed dealt with other things as well, and submitted statistics as to wages in tramway and other employments, and as to tramway payments in relief of rates and for track maintenance. The sins of the Post Office in regard to liability for damage by electrolysis were not forgotten. These matters are of much interest, but they have not the feature of novelty which is presented by the passing of the Road Traffic Act. Alderman Canby hailed the Act with enthusiasm. He says that it commits the most beneficent massacre in the history of local government in this country. Probably a large proportion of readers will agree with him, and we have ourselves expressed a similar view. As he says, the Act repeals the powers of 1,345 omnibus licensing authorities, and what is more remarkable, without protest from the victims. The Alderman anticipates, among other things, that there will be no more petty prosecutions for overcrowding omnibuses, and the difficult question of the legal meaning of "plying for hire" will disappear. Naturally the president paid a high compliment to Mr. Herbert Morrison, the Minister of Transport, for his courage, perseverance, and ability in getting the Act passed. One thought, however, remains for the cautious observer. It may be summed up in two well-worn phrases—"great expectations" and "wait and see." The expectations of the effects of the Act are great in various respects, and in particular as to how the new area traffic commissioners carry out their duties. Sometimes great expectations are more or less disappointed; if they are in this case, then there will be a call for amending the Act, so in that regard all concerned will have to wait and see. So far, however, as can be seen at the moment, there is good reason for great expectations.

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**Safety Glass.**

There appears to be little doubt that the unanswerable arguments in favour of the fitting of unsplinterable glass to all public service vehicles will eventually result in its use becoming compulsory. At one of the conferences which the Minister of Transport is holding in order to obtain the most complete information to assist him in drafting the new road traffic regulations a representative body of manufacturers and users discussed this important matter and we understand were in agreement as to the necessity for its general use in the interest of public safety. The point upon which there does not appear to have been agreement is the period after which no vehicle will be licensed unless it is fitted with unsplinterable glass. In the case of motor coaches, from July 1 of this year, all new vehicles presented for licensing in the Metropolitan Police District must have their windscreens fitted with safety glass, but as the fitting of the complete vehicle is a much bigger undertaking it is evident that a reasonable period after the issue of the order of the Minister must be allowed. From the public safety point of view it is imperative that no unnecessary time should be lost in putting an end to the grave risks of injury by broken glass to which every user of public vehicles is subjected.

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# THE MUNICIPAL TRAMWAYS AND TRANSPORT ASSOCIATION

*(Incorporated)*

## Twenty-Ninth Annual Conference held at Harrogate

### on September, 24, 25 and 26, 1930.

As the Municipal Tramways and Transport Association increases in age, the difficulties with which the members are confronted increase, both in number and degree. The position of the municipal transport industry is, however, in this respect, similar to that of all organisations concerned with public transport. We are in the midst of a period of transition unexampled since the early days of steam locomotion, and although there are signs of the approach of a more tranquil era, it will undoubtedly be far less stable than the years that preceded the war. That municipal transport is so successfully meeting the present difficulties is due in no small measure to the work and influence of the Association. It has enabled its members to unite in efforts to improve the legislative position, and it has succeeded in preparing the way for an expansion of their policy and the enlargement of their activities There may be some who, on broad grounds of public policy, may question the wisdom of such development, but from the point of view of those who direct the work of the Association, there is no doubt that the coming expansion is both desirable and inevitable.

For this reason it must be highly gratifying to the Council that the attendance at the twenty-ninth annual Conference which was held at Harrogate from September 23 to 26, constituted a record. Of the 103 local authorities which are members of the Association, no less than 98 were represented. So large an attendance indicates the growing influence of the Association, and testifies to the appreciation of local authorities throughout the country of the work which has been done by it in the interests of municipal transport. The large attendance was fully justified by the interest and importance of the proceedings. The presidential address of Alderman T. Canby emphasised the fact that they had just emerged from the toils of the most momentous year in the annals of the Association, and brought the salient features of the work of the year and their bearing on the present position to the attention of the members in an able and effective way. Only two papers were included in the programme, but they dealt so usefully and comprehensively with topics of immediate and vital interest that they gave rise to discussions which out-ran the time allotted to them and would, had it been possible, have easily occupied another day. Councillor Gledhill's comprehensive paper on the "Transition in Road Passenger Transport, with Special References to the Changes that have taken place between 1928 and 1930," gives a conspectus of these critical years and includes much information which will be of value for a long time to come.

Mr. Vane Morland's paper on "The Progress made in the Development of the Heavy Oil Engine" was opportune and awakened the keenest interest. Developments of recent months had aroused much curiosity and a thirst for information which the paper largely satisfied.

Although the formal programme of the Conference did not begin until the Wednesday morning, a large number of delegates arrived on the previous evening and were present, with over 150 ladies and other guests, at the reception at the Spa Rooms by the Mayor, Alderman R. Annakin, the Mayoress, and the President, Alderman T. Canby, and his daughter (Mrs. J. Hirst). Prominent among the guests were M. F. de Lancker, president of the International Tramways Light Railways and Public Transport Union, and M. A. de Backer, the general secretary. It was remarked that this was the first occasion on which any representative of the Union had attended a tramway meeting in England since the Union held its biennial Congress in 1902 in connection with a Tramway and Light Railway Exhibition in London, organised by THE TRAMWAY AND RAILWAY WORLD with the assistance of an honorary committee of leading tramway managers. On that occasion the visitors were officially welcomed by the Rt. Hon. Gerald Balfour, then President of the Board of Trade.

On the Wednesday morning, after a meeting of the Council, the delegates were given a cordial civic welcome by the Mayor of Harrogate, who remarked that the tramway and omnibus undertakings represented by the members of the Association had a capital value of about £90,000,000.

#### THE PRESIDENT'S ADDRESS.

The President then read his address, in the course of which he said the year 1930 would be reckoned as the year of "The Reformation" in the road transport world and of legislative rationalisation of the most comprehensive kind. Vast changes impended under the Road Traffic Act, which committed the most beneficent massacre in the history of local government. It repealed the licensing powers of 1,345 authorities without protest. For five years the Association had pleaded that local authorities were entitled to equality of opportunity combined with equality of obligations and responsibilities in the provision of the means of road passenger conveyance. In justice, they were entitled to priority as long-established operators. The most progressive of them had been compelled to look on while private enterprise in this branch of public service had reaped great rewards. Under the Road Transport Act, local authorities were given powers to operate omnibuses. Of the 103 members of the Association, 86 had obtained omnibus powers and were exercising them. Part V, however, should be of considerable service to them.

Ex-Bailie Burt, of Glasgow, moved a vote of thanks to the President for his address, which was seconded by Councillor A. E. Pape, of Ramsbottom.

The President then called on M. F. de Lancker, managing director of the Brussels Tramway Company and President of the International Tramways and Public Transport Union, who delivered an interesting speech in English, and cordially urged British tramway undertakings to become members of the Union. He also invited representatives of tramways in this country to attend a meeting of the Union in Paris in October to consider results obtained by the Paris tramways and other undertakings from experiments in regenerative control. Mr. R. Stuart Pilcher thanked M. de Lancker for his invitation and expressed an earnest wish that British participation in the Union would be encouraged by what M. de Lancker had said. Councillor I. Brassington, chairman of Manchester Transport Committee, also pressed the claims of the Union to greater British support than it had received in the past.

The presentation of medals and cheques won in the Essay Competition for 1930 followed. The President greeted the recipients, whose names will be found on a following page, and emphasised the desire of the Council that the competition should receive increased attention. For the first time a prize was awarded to a woman, Miss Phyllis L. Blakemore, of Wolverhampton, who was loudly cheered.

#### ELECTION OF OFFICERS.

The annual general meeting was then held. The Report of the Council, which dealt with many topics and was presented in the form of a large octavo pamphlet of over sixty pages, after some discussion, was unanimously adopted. The election of officers resulted in the following appointments.

#### PRESIDENT.

Mr. R. Stuart Pilcher (General Manager, Manchester Corporation Transport).

#### VICE-PRESIDENT.

Alderman A. G. Ellaway, J.P. (Vice-Chairman, Birmingham Corporation Transport Committee).

Mr. A. R. Fearnley (General Manager of Sheffield Corporation Transport) was re-elected Treasurer, and Mr. F. H. C. Wiltshire (Town Clerk of Birmingham) was re-elected Honorary Solicitor. Alderman W. Greenwood, J.P. (Salford), Alderman George Hill, J.P., (Burton-on-Trent), were elected as new members of the Council.

#### COUNCILLOR GLEDHILL'S PAPER.

The Conference was resumed after the annual meeting, and the delegates listened with close attention to the reading of the long and notable paper by Councillor A. H. Gledhill, Chairman of the Halifax Corporation Tramways Committee, which is given in full in the following pages and merits the careful study of all those concerned in municipal transport. The author had devoted much

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thought and time to its preparation, and his views have special claims to consideration, because of his experience and position. With his criticism of the method of presenting omnibus accounts, there will be general agreement. He declared that all published statistics of omnibus accounts are misleading and take no account of the different methods of purchasing omnibuses—some are purchased out of revenue, some out of borrowed money, while others divide the cost between the two. Mr. Gledhill emphasised the need for a standard system of costs, and declared that comparisons between various systems were immensely important from a managerial point of view.

Referring to the future of tramways, Mr. Gledhill declared that where a tramway undertaking is equipped with double lines of track and fast-running modern cars, that undertaking will be able to hold its own for some years to come against any form of transport.

A long and somewhat rambling discussion followed, in which the main theme of the paper was largely disregarded, while attention was largely directed to the inevitable controversy of omnibus v. tramway. Both sides had their dogmatic advocates. The prophecy of one speaker that in ten years there would be hardly a tramcar running in this country, was generally regarded as true only of the smaller towns. The discussion was continued on Thursday morning, and at its conclusion Mr. Gledhill made a detailed reply.

### Mr. Vane Morland's Paper—The Heavy Oil Engine.

Thursday afternoon was devoted to a paper by Mr. W. Vane Morland, General Manager and Engineer, Walsall Tramway and Motor Services, on "The progress made with the development of the heavy oil engine." The Sheffield and Walsall Corporations' experiments showed, he said, that the fuel costs of operating a double-deck omnibus were approximately ½d. per omnibus mile. A comparison of the fuel costs of a single-deck petrol omnibus at Walsall with those of a heavy oil engine omnibus showed a saving of £175 per annum. On petrol the average number of miles per gallon was 8; on oil fuel 18. Besides the amazing fuel economy, its immunity from fire weighed heavily in its favour.

Mr. A. R. Fearnley, in opening the discussion, gave an interesting account of his experiments with heavy oil engines, and suggested that the larger local authorities should encourage British manufacturers to pursue further experiments.

After a number of other members had spoken Mr. Morland replied at some length, and it was long past the hour fixed for adjournment when proceedings terminated. Before the delegates dispersed, however, a hearty vote of thanks was given to the President for his services during his important year. In expressing his thanks, Alderman Canby made a cordial acknowledgment of the support he had received from the Council, and especially from Mr. Beckett, to whose services, as general secretary of the Association, he paid an enthusiastic tribute.

### The Minister of Transport at the Annual Dinner.

The annual dinner was held on the Wednesday evening at the Hotel Majestic, when more than 400 delegates, ladies and other guests were present. The toast of the evening proposed by the President was "The Minister of Transport."

Mr. Herbert Morrison, in reply, remarked that it was natural that the Association should be in a rejoicing mood at the incorporation of Part V in the Road Traffic Act. For years the municipalities had complained of the expense and trouble of promoting private Bills when they wanted to run an omnibus service. Part V incorporated all the essentials of the Association's Omnibus Bill. If the municipalities were to take their proper place in the provision of transport services, they must come together, or they would be swamped by large-scale private enterprise. The municipality must run its trading undertaking on the best commercial lines. The efficient general manager must be made to feel that he was a business man first, and short of committing his council on questions of policy and finance, he and his chairman must have the right to take urgent decisions, subject to reporting to the committee. The Road Traffic Act would enable the Minister of Transport to take big strides in securing order on the King's highway. Congestion, overcrowding, and lack of regulation, besides meaning danger to life, were contrary to a sound standard of public economy, in view of the monetary value of road space. The presence of a large number of motor coaches in places like Central London was not to be recklessly tolerated, and all concerned in the rushing of new coach and omnibus services on to the roads in London and elsewhere should not assume that he would submit to accomplished facts when the Road Traffic Act came into force.

### Social Side of the Conference.

The social arrangements in connection with the Conference were exceptionally pleasant. The Hotel Majestic provides admirable facilities for such a large gathering, and the dances after dinner on the Wednesday and Thursday were much enjoyed, particularly by the large number of lady guests. A special programme was arranged to occupy them during the time when the Conference was in session. They paid visits to the works of Messrs. Rowntree & Co., Ltd., at York, where Alderman Oscar Rowntree escorted them over the works and entertained them at tea. Visits were also made to York Minster, Ripon Cathedral and Studley Royal.

During the Conference the delegates inspected with much interest the Leeds Corporation double-deck omnibus which the general manager, Mr. R. L. Horsfield, had sent to Harrogate for the purpose. This omnibus, built by Crossley Motors, Ltd., is equipped with a Gardner engine burning heavy oil, and is similar to one installed by Mr. Morland in a Walsall omnibus. Trial runs in the new vehicle, which is illustrated elsewhere in this issue, indicate that with a little further development, it will become a thoroughly efficient and practical machine capable of meeting all the requirements of a regular omnibus service.

On Friday, the concluding day of the Conference, the delegates and guests, numbering over 400, travelled by omnibus from Harrogate to Huddersfield, where they were entertained to luncheon by the Mayor, Alderman Walker T. Priest, the Chairman of the Tramway Committee, Alderman T. Canby, and the members of the Tramways Committee.

At the luncheon the delegates took leave of Bailie Burt, ex-convener of Glasgow Tramways Committee, who, after more than fifty years' membership of the City Council, is about to retire. The President made an affecting allusion to the loss the Conference will sustain and spoke of Bailie Burt's work in connection with the Glasgow tramways extending back to the time the city began to operate the horse-drawn cars in 1894, and continuing through the pioneer days of electrification in 1898 and the subsequent period of rapid development to the present time. Bailie Burt received a great ovation from the delegates.

After luncheon the party continued their journey by road to "Temple Newsam," near Leeds, where tea was provided by the Leeds City Transport Committee. Subsequently the party returned by coach to Harrogate. With the exception of the last day, the weather was generally favourable and the visitors found that the amenities of Harrogate made it an excellent conference centre.

The interest of the meeting was well maintained throughout, and it would be difficult to improve on the arrangement of the programme which provided more opportunities than usual for informal exchange of views which constitutes so large a part of the usefulness of such gatherings. The delegates greatly appreciated the arrangements made for their convenience and comfort by Mr. Beckett, the general secretary and Mr. Chadwick, the assistant general secretary, with whom should be mentioned Mr. A. A. Blackburn, the General Manager and Engineer of Huddersfield Corporation Tramways, who was specially responsible for the arrangements on the last day.

## REPRESENTATIVES AND OFFICERS APPOINTED AS DELEGATES TO THE CONFERENCE.

| Authority | Representatives | Designation |
|---|---|---|
| **Aberdare U.D.C.** | Coun. David E. Davies | Vice-chairman |
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| **Aberdeen** | Coun. James George | Convener |
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| | Coun. W. G. Greenwood | Vice-chairman |
| ,, | Chas. I. Baker | General manager |
| **Ayr** | Bailie C. C. Hutchison | Convener |
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| **Barrow-in-Furness** | Coun. W. A. Pickthall | Chairman |
| | Thos. Smalley | General manager |
| **Belfast** | Coun. J. D. McClure, J.P. | Chairman |
| ,, | Coun. Joseph Maguire | Member of committee |
| ,, | Wm. Chamberlain | General manager |
| **Bexley Council Tramways** | Coun. A. J. Franklin, J. P. | Chairman |
| | A. J. Abraham | General manager |
| **Birkenhead** | Ald. S. Vaughan, J.P. | Chairman |
| ,, | C. Clarke | General manager |
| **Birmingham** | Ald. A. James, C.B.E., J.P. | Chairman |
| ,, | Ald. A. G. Ellaway, J.P. | Vice-chairman |
| ,, | Coun. R. R. Gelling, J.P. | Member of committee |
| ,, | Coun. J. E. Corrin | Member of committee |
| ,, | A. C. Baker | General manager |

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| ,, | Charles Furness | General manager |
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| | E. T. O'Connor | General manager |
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| **Dearne Dist. Light Rlwys.** | Coun. M. L. Noakes, J.P. | Chairman |
| | R. Coutts | General manager |
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| ,, | John F. Richards | General manager |
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| ,, | Ben Hall | General manager |
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| **Reading** | J. M. Calder | General manager |

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| | A. G. Grundy .. .. | Transport manager |
| **Stockport** .. | Coun. T. E. Hunt .. | Chairman |
| ,, .. | Coun. T. S. Fish .. .. | Vice-chairman |
| ,, .. | A. T. Eardley .. .. | General manager |
| **Sunderland** .. | Ald. R. Dixon Jeffrey .. | Chairman |
| ,, .. | Coun. Jas. Wilson .. | Vice-chairman |
| ,, .. | Chas. A. Hopkins.. .. | General manager |
| **Swindon** .. | Ald. W. R. Robbins .. | Chairman |
| ,, .. | H. C. W. Ludgate.. .. | General manager |
| **Tees-side Railless Traction Board** | Coun. P. McPartlan .. | Chairman |
| | C. W. F. Cozens .. | Manager |
| **Todmorden** .. | Coun. J. H. Whitaker, J.P. | Chairman |
| ,, .. | Jas. Wild .. .. .. | General manager |
| **Wallasey** .. | Ald. J. G. Storey, J.P. .. | Mayor |
| ,, .. | Coun. S. Panter Brick .. | Chairman |
| ,, .. | H. H. Lincoln .. .. | General manager |
| **Walsall** .. | Coun. W. D. Forsyth .. | Chairman |
| ,, .. | Ald. J. Thickett, J.P. .. | Vice-chairman |
| ,, .. | W. Vane Morland .. | General manager |
| **Walthamstow** | Ald. H. Frost, J.P. .. | Chairman |
| ,, .. | G. R. Spurr .. .. | General manager |
| **Warrington** .. | Ald. G. Archer .. .. | Deputy-chairman |
| ,, .. | Coun. J. Banks .. .. | Member of committee |
| ,, .. | Coun. Canon Bardsley .. | Member of committee |
| ,, .. | J. Telfer .. .. .. | General manager |
| **West Ham** .. | Ald. Jas. H. Hollins, J.P. | Mayor |
| ,, .. | Ald. Walter J. Reed .. | Chairman |
| ,, .. | M. L. Slattery .. .. | General manager |
| **West Hartlepool** | Coun. C. L. Wainwright, J.P. | Chairman |
| ,, .. | H. E. Blakiston .. .. | Transport manager |
| **West Monmouthshire Omnibus Bd.** | Coun. Lewis Lewis .. | Chairman |
| | R. T. Brown .. .. | Manager |
| **Widnes** .. | Coun. R. Graham .. .. | Chairman |
| ,, .. | Coun. P. Hanley .. .. | Deputy-chairman |
| ,, .. | E. Wilson .. .. .. | Traffic manager |
| **Wigan** .. | Ald. Arthur Santus .. | Chairman |
| ,, .. | Coun. D. Rourke .. .. | Vice-chairman |
| ,, .. | J. Brierley .. .. | General manager |
| **Wolverhampton** | Coun. Alan Davies, J.P... | Mayor and chairman |
| | Coun. M. Christopher .. | Vice-chairman |
| ,, .. | C. Owen Silvers .. .. | General manager |
| **York** .. | Ald. Wm. Dobbie .. .. | Chairman |
| ,, .. | Ald. Wm. Horsman .. | Vice-chairman |
| ,, .. | R. S. Asher .. .. | Transport manager |

Hon. Members: T. B. Goodyer, O.B.E.
Henry Mozley.

J. Beckett, General Secretary.

Arnold W. Chadwick, Assistant General Secretary.

## WEDNESDAY, SEPTEMBER 24.
## THE OPENING SESSION

The twenty-ninth Annual Conference of the Municipal Tramways and Transport Association was held at Harrogate, on Wednesday, Thursday and Friday, September 24, 25 and 26, under the Presidency of Alderman T. Canby, chairman of Huddersfield Corporation Transport Committee.

Wednesday, September 24.

The Conference was opened in the Hotel Majestic, on the Wednesday morning, where the delegates were given a civic welcome by the Mayor of Harrogate (Alderman Richard Annakin).

**The Mayor of Harrogate** said: Mr. President, ladies and gentlemen, my first words this morning must be to welcome you on behalf of Harrogate Corporation. I understand that this is the twenty-ninth annual conference of the Association and your first visit to what we here consider to be the premier Spa of the British Isles. From small beginnings your Association has grown, till it covers Great Britain and Northern Ireland with its 102 Local Authority members. You conduct an important branch of public service, of which every man is at one time or another a critic of various qualifications. It is very easy to be a critic: it is a very different thing when you attempt to construct. I am told that you employ in your important branch of public service a large number of people directly and many thousands indirectly, and a satisfactory feature about your work is that by the machinery of your National Whitley Council, industrial peace has been kept in your industry for many years. You are the custodians of large undertakings which have cost about £90,000,000 of capital in tramways and the two forms of omnibuses, viz., petrol omnibuses and electrically-driven trolleybuses. In Harrogate we have no municipal transport service, but only motor omnibuses for short and long-distance services, as you will see, operated by private enterprise. Both forms of ownership are, no doubt, feeling the adverse effects of the wave of industrial depression. I am glad to know that it is in this beautiful town that you are celebrating the great Parliamentary victory achieved by you, after five years of effort, by getting your Omnibus Bill through the second reading stage in the House of Commons last Session, a measure which, after much weary strife, was included in the Road Traffic Act, 1930. That Act, unlike most legislation bearing upon Local Government, does not add to the burden of the functions of local authorities, but it relieves them of duties which they have discharged since 1847, with varying degrees of dissatisfaction in recent years. It is a commonly recognised fact that the proper regulation of road passenger service has passed beyond the stage of control by individual local authorities. A service that operates from coast to coast will henceforth be governed by Traffic Commissioners for large areas, and that is doubtless a long step in the right direction. Every day local authorities are moving towards the front line of omnibus operators; you have already sunk many millions of capital in that service and I hope you will reap the fruit of your enterprise. May I venture to hope that your meetings at Harrogate will be as pleasant as the sunshine this morning, and that when you leave you will carry away with you the most pleasant impressions and long to come again and even recommend Harrogate to your friends. I understand this is the first time your Conference has been held here; may I express the hope that it will not be the last time.

**The President:** May I, on behalf of the Association, express to you, Mr. Mayor, our very hearty thanks for your invitation to hold this Conference in Harrogate and for the words of welcome which you have expressed this morning. When I found there was an opportunity for me to have a voice in the selection of the place where the Conference should be held, my thoughts went straight-away to Harrogate. It is a town of which the Mayor and citizens may well be proud. The Mayor has claimed that it is the premier Spa in England. I should be inclined to say it is the premier Spa in the British Isles. I claim it to be the gem of Yorkshire. I am sorry that the Conference could not have been held in Huddersfield, but that is an industrial town and does not provide accommodation for visitors on the scale that we find here; I am sure, however, the members will enjoy their visit to Harrogate, and I have no doubt that if in future years any of the members should require the waters of life, they will come to Harrogate to get them. In conclusion, I will again thank the Mayor and Corporation for their welcome to Harrogate this morning.

**The Mayor:** I can only say that it has been a real pleasure and a privilege to welcome you to Harrogate.

The President then delivered his Presidential Address.

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# PRESIDENTIAL ADDRESS.

BY ALDERMAN THOMAS CANBY, J.P.

*Chairman of the Huddersfield Corporation Tramways and Motor Omnibuses Committee.*

We have just emerged from the toils of the most momentous year in the annals of the Association. Without doubt the year 1930—sixty years after the Tramways Act was passed—will be reckoned as the year of The Reformation in the road passenger transport world and of legislative rationalization of the most comprehensive kind. Last year we had before us the case for local authorities which had been laid before the Royal Commission on Transport by Mr. Chamberlain on behalf of the Association. The text of it can be summed up in two words, namely, "Public Service." For five years this Association has pleaded that local authorities were entitled to equality of opportunity combined with equality of obligations and responsibilities in the provision of the means of road passenger conveyance. In justice, we were entitled to priority as long-established operators.

It is not without interest to recall the fact that the Corporation which I represent was the first in the Kingdom to break through the tradition, enshrined in many local Acts of Parliament, that local authorities could be trusted to construct tramways but not to operate them. In 1880, Huddersfield obtained Parliamentary powers to operate its tramways, which have a long record of success to their credit.

We live in a world of constant change, experiment and progress. The advent of the internal combustion engine opened up such a startling era that within a single decade it had challenged the position of the British railway companies as passenger transporters. Those companies, with a capital exceeding one thousand two hundred millions sterling, stood face to face, in 1928, with progressive competition of an increasingly menacing character. It found local authorities possessed of very limited powers, confronted with new conditions and armed only with weapons some of which were more than eighty years old. We have always been the Cinderella of the municipal family. Parliament, which cries out for their aid, and depends upon their co-operation for the administration of a long catalogue of national and local services, has never been willing to give to them but scanty powers of transport, with the result that the most progressive of them have been compelled to look on, while private enterprise in this branch of public service has reaped great rewards.

On this aspect of the subject I expressed my opinion at the Joint Meeting with the Members of the Association of Municipal Corporations in January last and need not repeat it now. One of my predecessors in the Presidential Chair, Alderman Mayne, used these words in his Presidential Address at Newcastle in 1922:—

> "Engaged as we are in operating a public-owned passenger "service, concerned only with efficiency and cost price whenever "we can get it; not impelled or stimulated by motives of profit, "we fear no competition under fair conditions, and if nothing "short of monopoly can secure to the community a self-sustaining "and efficient service, then on broad grounds of public policy "and in the public interests, we place our claim as high as that "of a monopoly."

Some local authorities and companies have obtained, since the Nottinghamshire and Derbyshire Traction Act, 1928, was passed, Parliamentary powers which protect their transport services from competition within limits, so long as they are adequate and satisfactory, to the point of monopoly. The last case is that of Glasgow.

Under the Road Traffic Act, 1930 (which does not apply specifically to tramways and trolley omnibuses), the Minister of Transport may, as the Council point out in their Report, modify or revoke such powers "to such extent as appears to him to be equitable in the circumstances," but only with the approval by Resolution of both Houses of Parliament. It would seem therefore that such authorities, having spent considerable sums in private Bill legislation and recently made out their cases before Parliament, may wear their laurels in ease without much fear of the invader.

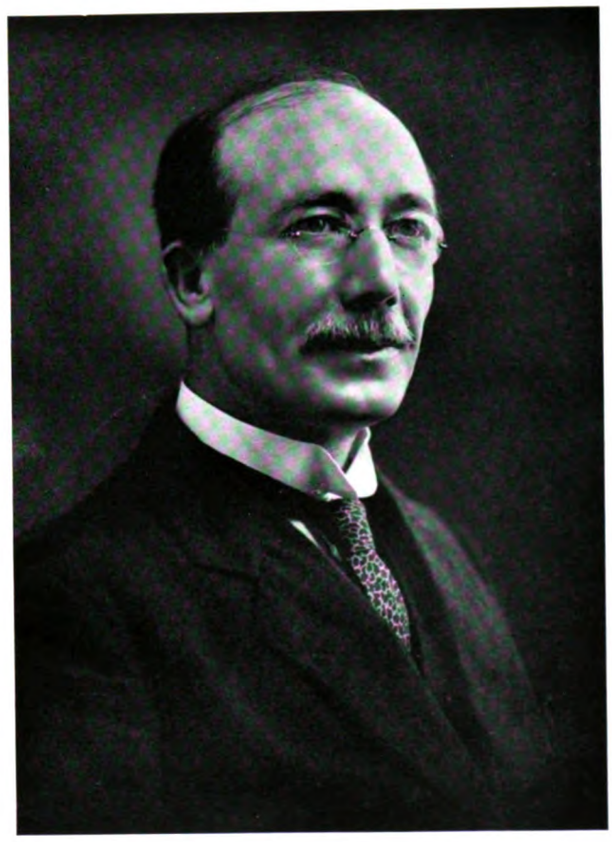
Some authorities have had to resort to some measure of protection by imposing higher fares upon competitive services, but that course, quite apart from the difficulty of enforcing it and the ingenuity displayed in dodging it, is not altogether satisfactory. It is invidious and unpopular and has led to friction between the operating and neighbouring authorities: moreover, it has not been effective.

When we turn to the local authority itself, we have found much divergence of opinion and even some perversity in the family. We have had our domestic antagonisms. Different committees of the same corporation have looked upon themselves as independent entities, and assumed an exclusive interest and concern in the functions delegated to them, notably omnibus licensing committees of some local authorities, notwithstanding that the authority itself was the licensing authority.

Then we have intractable neighbours of the non-co-operative sort, each playing for its own hand, dominated by petty jealousy and rejoicing in isolation and independence. Experience has proved that it has not been possible to obtain, in many cases, any effective measure of voluntary co-operation in this branch of the public service.

Last year, Mr. Chamberlain in his Address to you stated that some local authorities were not in a co-ordinating mood, and declared "that in the interest of the community there should be "an over-riding authority invested with the necessary powers to "insist upon conformity with the general traffic scheme of an area," adding with a touch of humour that "big ducks on little ponds" will have to be content to become "little ducks on big ponds."

In these circumstances, we had the Road Traffic Bill introduced



Alderman T. Canby, J.P.

*President, Municipal Tramways and Transport Association, 1929-30.*

into Parliament, prepared with unexampled expedition after the Second Report of the Royal Commission on Transport was issued. You know what vast changes impend under the provisions of that Act. Neither big nor little ducks will appear on the pond any longer. The Road Traffic Act commits the most beneficient massacre in the history of local Government in this country. It repeals out of hand the powers of 1,345 authorities which had licensing powers, and what is most remarkable of all, without protest from the victims. With its long arm it wipes out the Railway Passenger Duty Act, 1842, the Town Police Clauses Act, 1847, the Town Police Clauses Act, 1889, together with a host of other enactments, so far as they relate to public service vehicles.

We should now have done with petty and vexatious prosecutions for overcrowding of omnibuses under an Act of Parliament 88 years old, and with the elusive question—"what is plying for hire?" of which the Lord Chief Justice recently said that "nowhere has there "been any attempt to formulate an exhaustive definition."

I venture to congratulate Mr. Herbert Morrison, the Minister of Transport, upon the valiant fight he made in the interests of

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local authorities in the face of the most determined and sometimes merely obstructive opposition. He was confronted with no fewer than 1,246 Amendments to his Bill during the Committee stage. His battle was a man's fight against time and almost single-handed.

Of the 102 Members of this Association, 86 Members have obtained omnibus powers and are exercising them. Part V, however, should be of considerable service to them.

Some of the eighty-six Members have obtained powers to operate omnibuses both inside and outside their own areas. Some have powers to operate within their own areas only, and cannot extend their services to their own housing estates if they happen to be outside their own areas.

To both classes of authorities, this Act should be of considerable value, but most of all to those authorities that have not obtained any omnibus powers.

It was in view of the mandatory directions to the Commi sioners when granting road service licences to have regard to "the extent, "if any, to which the needs of the proposed routes or any of them "are already adequately served" (Section 72 (3) (*b*) that we issued a notice to all the Members of the Association on March 6th last, pointing out that if any Member had any proposed services under consideration they should lose no time in starting with them.

It is manifest that the Minister has had to effect compromises and to place local authorities at some disadvantage compared with other operators. The provisions of Sections 101 and 102 when compared with the original Omnibuses Bill, bear evidence of this fact.

The sweeping changes which will be brought about by Section 19, limiting the time for which drivers of certain vehicles may remain continuously on duty, and by Section 93, relating to the wages and conditions of employment of persons employed in connection with public service vehicles, will put an end, to some extent, to the advantages that some private operators have hitherto enjoyed by employing labour during unreasonably long hours and at low wages.

Turning to another subject, in some quarters, it is doubted whether the present rates of wages paid by local authorities to their transport employees are just, in comparison with those paid in the great industries of the country. The present rates paid to day workers became operative under the Award (The Decision and Report of the Wages Tribunal appointed by the National Joint Industrial Council for the Tramway Industry) on November 18th, 1924. Those wages were stabilised by that Award. Prior thereto, wages were adjusted on a sliding scale, and were increased or decreased by 1s. od. per week for each complete four points variation in the cost of living index figure. In July, 1924, when the Tribunal was appointed, the cost of living figure stood at 70 per cent. In July this year it stood at 55 per cent. It is the fact that if the sliding scale had remained in force wages would have been 4s. od. per week less than they are at present.

Notwithstanding this, the operative employees of the Liverpool Corporation Tramways Committee recently applied for an increase in wages of 4s. od. per week, which the Industrial Court, to which the application was referred, refused to award. The present wages of those employees are higher than those in the highest group in the Decision of the Tribunal above referred to.

We have reached a stage where the wages of non-skilled men bear no relation to those of men in skilled trades and industries. In the face of the unchecked and growing industrial depression and unemployment, it is becoming the duty of public men, who desire to deal justly, to consider afresh the relativity of wages of men engaged in sheltered industries with those of their fellow-men in competitive trades.

The present wages per hour calculated on the basis of a 48-hour week as laid down by the Tribunal are :—

FOR MOTORMEN.

| | Commencing | | Maximum | |
|---|---|---|---|---|
| | Per Week | Per Hour | Per Week | Per Hour |
| Group I ... | 60s. 6d. | 1s. 3⅛d. | 63s. 6d. | 1s. 3⅝d. |
| Group II ... | 58s. 6d. | 1s. 2⅝d. | 61s. 6d. | 1s. 3⅛d. |
| Group III | 56s. 6d. | 1s. 2⅛d. | 59s. 6d. | 1s. 2⅞d. |
| Group IV... | 54s. 6d. | 1s. 1⅝d. | 57s. 6d. | 1s. 2⅜d. |
| Group V ... | 52s. 6d. | 1s. 1⅛d. | 55s. 6d. | 1s. 1⅞d. |
| Group VI | 50s. 6d. | 1s. 0⅝d. | 53s. 6d. | 1s. 1⅜d. |

FOR CONDUCTORS.

| | Commencing | | Maximum | |
|---|---|---|---|---|
| | Per Week | Per Hour | Per Week | Per Hour |
| Group I ... | 56s. 6d. | 1s. 2⅛d. | 59s. 6d. | 1s. 2⅞d. |
| Group II ... | 54s. 6d. | 1s. 1⅝d. | 57s. 6d. | 1s. 2⅜d. |
| Group III | 52s. 6d. | 1s. 1⅛d. | 55s. 6d. | 1s. 1⅞d. |
| Group IV... | 50s. 6d. | 1s. 0⅝d. | 53s. 6d. | 1s. 1⅜d. |
| Group V ... | 50s. od. | 1s. 0½d. | 51s. 6d. | 1s. 0⅞d. |
| Group VI... | 48s. od. | 1s. od. | 49s. 6d. | 1s. 0⅜d. |

These men are provided with uniform clothing at the expense of the authority, they travel free to and from duty, and have at least eight days' holiday annually with pay.

The foregoing rates may be compared with the following basic rates of wages for Huddersfield and District :—

| Men | Rate | Men | Rate |
|---|---|---|---|
| Fitters .. .. | 44s. od. | Drillers | 34s. od. to 41s. od. |
| Brass finishers .. | 44s. od. | Shapers | 34s. od. to 40s. od. |
| Turners .. .. | 44s. od. | Engineers' Joiners.. | 49s. od. |
| Patternmakers .. | 49s. od. | Moulders .. .. | 48s. od. |
| Millwrights .. .. | 48s. od. | Core Makers .. | 40s. od. |
| Blacksmiths .. | 48s. od. | Brassmoulders .. | 48s. od. |
| Smiths' Strikers .. | 33s. od. | Irondressers .. | 35s. od. |
| Planers | 36s. od. to 41s. od. | Cupola Men | 33s. od. to 43s. od. |
| Borers | 34s. od. to 43s. od. | Labourers .. .. | 31s. od. |

The above rates are basic rates, and are subject to a bonus of 10s. od. per week in respect of men engaged on any system of payment by results, and a bonus of 12s. od per week in respect of men on plain time work.

The following rates of wages are recommended in the Macmillan Report on the Textile Industry of Yorkshire :—

TURNERS PAID BY TIME.

Paid a basic rate of 43s. od. for 48 hours plus 3s. od. on base plus Cost of Living £1 4s. 2d., equals £3 10s. 2d.

TIMEWORKERS, MALE, SCHEDULED.

Paid a basic rate of 28s. 10½d. per week of 48 hours plus 5 per cent. on base, 1s. 5¼d. plus Cost of Living percentage at 64 per cent., equals 19s. 5¼d. Total wage, £2 9s. 9d. per 48 hours.

TIMEWORKERS, MALE, UNSCHEDULED.

Paid a basic rate of 27s. 9d. per week of 48 hours plus 5 per cent., 1s. 4¾d. plus Cost of Living percentage at 64 per cent., 18s. 7¾d. Total wage, £2 7s. 9½d.

The transport of passengers on the road is a social service of importance and necessity for a large part of the community, but it stands on a commercial basis, and as a matter of principle should not be subsidised either by cheap labour on one hand or by local rates, imposed impartially on every citizen, on the other. We all know that this ideal has not always been possible of attainment owing to varying local conditions arising mainly from unequal and unjust competition. It is a service distinguished from most local services in this respect :—that it is available for the people who provide it and are financially responsible for it and for non-citizens alike.

There should, obviously, be some equitable relationship between the rates of wages at which skilled, semi-skilled and unskilled labour are compensated. The frontiers between sheltered and unsheltered industries are well defined—between competitive and non-competitive industries—and when one is used to throw a burden on the other the economic machinery is damaged, if not put out of action, to the discouragement of industrial progress, efficiency and achievement.

It is surely a commonplace that neither the employees nor the employers in an industrial nation struggling against adverse world markets can submit, for long, to the continuance of such conditions without disastrous results. We are always glad to have and to fully recognise a contented and efficient service, but when the national wages fund becomes depleted and sound commercial principles, as well as industrial conditions, are standing on their heads, then there is the strongest case for revision in the general interest.

In the Report on "The effect of taxes upon prices" presented to the Management Committee of the General Federation of Trades Unions, on March 12th, 1930, some pertinent observations are made that are relevant. It is there stated that :—

> "The truth is that all these (workmen's insurances, pensions, housing and education expenditures) and others such as holidays with pay for municipal workers, have to be earned by the cotton operative, the wool worker, the engineer, the shipwright, and even the agricultural labourer. It is the industry of these and others similarly engaged which produces that wealth out of which the costs of social improvements are met. If strict social justice were meted out, these actual producers should be the first and not the last to enjoy whatever good things their efforts make possible. It is important that the workers of Britain should realise where the burden of all taxation ultimately falls, and to what extent it prevents the accumulation of that capital which is necessary to maintain and expand that industry by which they live."

**TRAMWAYS AND LOCAL RATES, ETC.**

The results of tramways, taken in the aggregate, have been advantageous to the ratepayers. Large sums of money have been applied in the provinces in reduction of rates.

In fact, rate relief rather than renewals funds has too often obtained a prior claim. Last year, one city took £10,000 from the renewals fund for the relief of the rates, after incurring a loss of over

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£47,000 within the year. Some have applied in rate-aid more than half their present total outstanding debt. Others, acting with greater foresight, have used their available surpluses in purchasing capital assets instead of raising further loans, and by so doing have enriched their undertakings, whilst there are some members of this Association which are entirely free from debt.

I find that during the last six years tramways have provided a net sum of over £1,214,000 in direct relief of the ratepayers' burdens, namely :—

| | Amount devoted to Rate-aid | Amount charged on the Rates | Net Amount devoted to Rate-aid |
|---|---|---|---|
| | £ | £ | £ |
| 1923-24 .. .. | 280,399 | 128,600 | 151,799 |
| 1924-25 .. .. | 281,732 | 101,596 | 180,136 |
| 1925-26 .. .. | 331,227 | 101,403 | 229,824 |
| 1926-27 .. .. | 334,080 | 110,834 | 223,246 |
| 1927-28 .. .. | 420,011 | 120,251 | 299,760 |
| 1928-29 .. .. | 288,784 | 159,113 | 129,671 |
| | £1,936,233 | £721,797 | £1,214,436 |

In addition to this, they have paid in RATES AND TAXES no less than £5,956,133.

| | |
|---|---|
| 1923-24 .. .. | £879,980 |
| 1924-25 .. .. | £1,003,773 |
| 1925-26 .. .. | £1,023,612 |
| 1926-27 .. .. | £1,021,574 |
| 1927-28 .. .. | £1,025,429 |
| 1928-29 .. .. | £1,001,765 |
| | £5,956,133 |

Further they constructed and maintained the permanent way used by all the traffic on the roads.

The cost of maintaining the permanent way for the last six years has been £9,658,172.

| | |
|---|---|
| 1923-24 .. .. | £1,905,665 |
| 1924-25 .. .. | £1,730,173 |
| 1925-26 .. .. | £1,626,867 |
| 1926-27 .. .. | £1,518,992 |
| 1927-28 .. .. | £1,475,459 |
| 1928-29 .. .. | £1,401,015 |
| | £9,658,172 |

They have been and are the largest users of electricity at a cost in excess of most other users, and have thus helped electricity undertakings. The annual bill has been as follows :—

| | |
|---|---|
| 1923-24 .. .. | £2,691,587 |
| 1924-25 .. .. | £1,911,611 |
| 1925-26 .. .. | £1,864,022 |
| 1926-27 .. .. | £1,815,404 |
| 1927-28 .. .. | £1,883,259 |
| 1928-29 .. .. | £1,795,095 |
| | £11,960,978 |

Notwithstanding these imposts laid upon tramways, they have proved the cheapest means of regular road travel for every industrial community.

We have now reached the stage at which the cost of renewals is excessive, and on systems depending on loops and passing places, prohibitive. Under these circumstances, some Members are looking for other means of transport adapted to their own areas. Each has its own special claim and it would probably be impossible to constitute a panel of engineers who would agree with unanimity upon either omnibuses or trolley omnibuses. "When doctors disagree experience only can decide."

There are two other subjects to which I should like to refer.

FIRST :—For five years we have had an annual Essay Competition, and have offered substantial money prizes and silver medals. This year, the Competition was in two sections, the first of which was open to all persons employed on the Supervisory and Administrative Staffs, and the second to all other persons employed by the Members of the Association. The total number of essays received was 74, of which 30 were in the first section and 44 in the second. You will probably be surprised to learn that not a single employee of 68 Members—or two-thirds of the Membership of the Association—took any part in the Competition. In view of the fact that the total number of persons in the employment of the Members of the Association exceeds 80,000 this measure of support is deplorable. It certainly discloses a lack of ambition and enterprise. The love of easy entertainment and amusement, and the growing indifference to the constantly increasing facilities for personal improvement are symptoms of a national disease, which is gnawing at the vitals of the national character. The purpose of these competitions was to afford to capable and aspiring employees opportunities for self-disclosure for the benefit of those who look for competence when vacancies arise.

I am assuming, of course, that every General Manager has co-operated with the Council in disseminating amongst all the members of his staff an intimation of these excellent competitions.

SECOND :—The other subject is electrolysis, in which I have long taken a personal interest. It is referred to in the Report of the Council. In most cases of electrolytic action on post office cables, the Post Office officials turn, by a sort of tradition, to tramways, and never to themselves.

They seem to have established a Cult with a dogmatic creed, the first article of which is that the Post Office can do no wrong ; the second that the High Priest must be a Post Office official, and the third that local authorities are always wrong although they may conform to the last jot and tittle of the ritual of the craft.

In fact, they recently informed one of the Members of the Association that their claim against that authority is based on an Act of Parliament passed in 1878 "which places on any undertakers, body or person, who by themselves or their agents destroy or injure any telegraphic line an absolute liability—*independent of proof of negligence*—for the cost incurred in making good such destruction or injury."

Now, all electric tramways are subject to regulations made by a Government Department, yet we are told that although such regulations may be completely complied with, there is no immunity for municipalities from responsibility. It seems to me, as it must seem to you, that such a condition of affairs is unsatisfactory and indefensible. Conferences have been held with the Ministry of Transport, the Post Office Authorities and the Tramways, Light Railways and Transport Association, but no satisfactory progress has been made so far. The Post Office Authorities refuse to adopt measures that have been shown by long experience to be effective. We have been informed, in effect, that that Department will not incur any expenditure in investigating the root of the trouble. It will be observed from the Report of the Council that we were waiting for a translation of the proceedings of an International Commission which met in Paris in October last. That Report is now available, so that the conference referred to can be resumed.

Our attention has been called to a remarkable instance in the experience of one of the Members of the Association. In one large County Borough there has been for more than a quarter of a century a most complete drainage system, and electrolytic corrosion has never been known there or any ill-effects discovered.

Many Members are at present in conflict with the Post Office Engineering Department on this subject, and are threatened with proceedings in the Courts for the recovery of claims that they dispute.

In Huddersfield we have an example of Post Office cable laying, which is calculated to invite trouble by reason of the Post Office having laid their cable in close proximity to tramway cables. I am sure many Members could adduce similar instances. No doubt I am expressing the views of the Members of the Association when I say that rather than waste public money in litigation between the State and Local Authorities we shall regard it as an imperative duty to consider the question with statesmen in charge of the appropriate Departments who have a proper sense of their own responsibilities to the nation, as well as of ours to our own local communities.

Lastly, let me thank you for the honour of occupying this Chair during the year, and also my colleagues on the Council for their never-failing support. The President of this Association is the captain of a very competent team of diversified gifts but one common purpose. I am sure my colleagues will excuse a personal reference to one of them, now that the work of the year can be reviewed in retrospect. It is true that we had a special committee bearing heavy responsibilities for the Omnibuses Bill, which in a modified form is now included in the Road Traffic Act, but to Mr. A. R. Fearnley belongs the distinction of preparing the first draft of it, based in some degree upon the Bill of 1926, but cast in a much bigger mould. I venture to take this opportunity of expressing to him the thanks and high appreciation of this Association for his prudent and practical services during the year. Similarly and very gladly do I acknowledge on your behalf the advice and assistance we have received from the honorary solicitor, Mr. Wiltshire, the Town Clerk of Birmingham.

It is now my pleasure to offer to you all a very cordial welcome to this Conference. Owing to conditions beyond my control we cannot meet in Huddersfield, but I have no doubt that Harrogate is an acceptable alternative. At the same time, the Huddersfield Corporation Tramways and Omnibuses Committee, of which I have the honour to be Chairman, invite you to accept their hospitality in Huddersfield on Friday. On that day, we have also been invited

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to be the guests at tea of the Leeds City Transport Committee at Temple Newsam, now the property of the Leeds City Council and formerly the stately home of the present Viceroy of India.

Once again I bid you welcome, and hope the Conference will be profitable to those we represent and a source of pleasure and satisfaction to you all.

## VOTE OF THANKS TO THE PRESIDENT.

**Bailie Peter Burt** (Glasgow): Speakers on an occasion like this usually commence by saying that they have listened with great interest to the address. I do not know that I have listened to a Presidential Address which has been more controversial than this one. There are many questions raised with regard to the relationship between the public administration of tramways and other public affairs, and one or two of them might involve a lengthy discussion. This, however, is not the time to start such a discussion, although I think it would be very advantageous if we had an opportunity of discussing some of them during the Conference. One of them I should like to mention now, and that is the question of wages. I rather deprecate the idea that we are going to solve our social problems by bringing down wages. Our object should be not to bring down high wages, but to raise low wages. I have been in business for fifty years, and I have never yet found that a low-wage man is as efficient or as valuable in the business as a well-paid one. I remember before Glasgow Corporation took over the tramways that one of the grievances against the old company was the low-paid and inefficient labour they employed. One of the objects the Corporation had was to establish a good standard of wages and conditions of labour, in order to get the employees interested in the business and in its development. I once had a long conversation with an American manufacturer, and he said that the failure of Great Britain to keep pace with the development of the world was the question of attacking workmen's wages. He said that when we put a more efficient machine in a factory the first thing the manufacturer did was to see how he could cut down wages. In America, however, the opposite is the idea especially in the minds of engineering people. When they put in a more efficient machine they look round for a more efficient and well-paid man to look after it. With regard to municipal tramway operation, I should like to call attention to the narrow-minded jealousy which often exists in small local authorities against the tramway undertaking. That is due to the fact that these undertakings are operated by companies, and the result of the attitude of the local authorities has been to drive many of these concerns into bankruptcy. At the same time it is astonishing how, in many cases, municipal trading or municipal improvements do not benefit the community. There is, however, one class who always benefits, and that is the landlords. In Glasgow, for instance, we are proposing to build a new garage, and there were 70 acres of derelict land available. The value of the land in the rating books was nothing, but the other day the land changed hands for £7,000. The Presidential Address is, however, not open to discussion. I think it is a very able address, the preparation of which must have involved a great deal of consideration and thought, and I have the greatest pleasure in proposing a hearty vote of thanks to Alderman Canby for it.

**Councillor A. E. Pape** (Ramsbottom) seconded the vote of thanks, which was carried unanimously.

**The President:** I only want to say one word in expressing my appreciation of your vote. I was not advocating low wages, but equality of wages, and in doing so I believe I have said what a great many people think.

**The General Secretary** in reply to a question, stated that the address would be printed in the Journal of the Association, and any copies required could be supplied.

After mentioning the receipt of letters of regret at inability to attend, the *President* expressed the gratification of members that Mr. John Arnot, M.P., who moved the second reading of the Association's Omnibus Bill in Parliament, was present at the Conference.

**Mr. John Arnot, M.P.,** (Leeds), who was cordially received, said: I do not wish to delay the proceedings at this stage, but as special reference has been made to my efforts in the House of Commons for the Omnibus Bill, I can only say that nothing gave me greater pleasure than to take a part in bringing this matter before Parliament. We were not quite sure whether we ought to bury the Bill, having regard to the fact that the Road Traffic Bill was coming along, or whether we ought to revive the Bill in another form. It was ultimately decided that it would have to undergo a sort of resurrection in a new form, and in that form it has become law. As a former member of this Association, I was very keenly interested in the progress of this Bill, and also as a member of a local authority which has suffered, I suppose, as much as any authority, through the former state of the law. I am glad that the matter is, at any rate, now partly settled. I do not say that we have yet got complete equality for municipalities, and I should not advise the Association to rest on their laurels. I believe we have still further fields to conquer. We have been able to break some of the fetters, and are now able to work with greater freedom. I am delighted to have had some hand in bringing that about.

**The General Secretary:** We have also present with us to-day representatives from Brussels, namely, M. Frederic de Lancker and M. André de Backer (President and Secretary of the International Union of Tramways and Light Railways). I have the happiest recollections of meeting M. de Lancker in Brussels some years ago, and he is here with M. de Backer to bring greetings from their Association.

**The President:** I am sure we are all delighted to have our visitors with us, and you will, I know, give them a very hearty welcome. I will ask M. de Lancker to say a few words.

### INTERNATIONAL TRAMWAY PROBLEMS.

**M. de Lancker:** Mr. President, ladies and gentlemen, in the name of the Board of the International Union of Tramways, Light Railways and Public Omnibus Transport, I have the great honour to thank the President, Alderman Thomas Canby, and the Council of the Municipal Tramways and Transport Association for their kind invitation to assist, with our General Secretary, M. de Becker, at your twenty-ninth Annual Conference. This is an invitation which we have had the greatest pleasure in accepting, and we appreciate the compliment of being asked to meet our British colleagues. I am very much obliged also to Mr. R. Stuart Pilcher, the Vice-President, whose presence at our twenty-second International Congress at Warsaw was much appreciated. Your kind invitation gives me the opportunity of declaring to you that the International Board of the Union is of the opinion that it is a matter of infinite regret that British participation in the affairs of the International Union is not greater. Certainly the conditions attending tramways operation in the various countries of the Continent differ from those in Great Britain, but the general principles are the same.

As a few months ago I had the opportunity of declaring at the Congress at Warsaw, the importance nowadays of transport is such that nobody would dream of calling it in question. It gives rise to various technical and economical problems, solutions of which are intimately bound up with the expansion of our towns. Transport also stimulates rational conceptions in the elaboration of building lines in large cities, and the solving of the difficulties arising from the exigencies of modern architecture in connection with the ever-growing extension of great living centres. It can be asserted that at present the progress of transport is being investigated and developed from a scientific angle and that the enlightened collaboration of the transport authorities with the public authorities, safeguarding the interests of the former and at the same time taking into account the responsibilities of the public authorities, has, in many cases, enabled the working of public transport undertakings in such a way as to blend the respective interests with general benefit, bringing valuable help to trade and industry and promoting the general welfare.

To those problems of general interest we have to apply questions concerning rolling stock construction, maintenance of the permanent way, electric equipment, braking, and other important matters. If we consider also that our specialist engineers are extremely active with new technical problems such as compound motor operation, experiments in regeneration of current, and the operation of Diesel oil vehicles, the conclusion must be that a greater number of tramway engineers should assist at periodical meetings for purposes of exchange of experience. It is very desirable that the leaders of the Continental tramways should be in intimate touch with the leaders of British tramways.

### AN INVITATION TO BRITISH TRAMWAY REPRESENTATIVES.

The greatest difficulty of the average British representative is that the discussions and literature of the International Congresses are only presented in French and German, but the International Union under certain conditions is prepared to provide for English as a third official language of the Association. At one time it would have meant a great complication and a loss of time for the necessary translations to be carried out, but thanks to modern science, there is now the possibility of the deliberations of International Congresses being carried on simultaneously in two other languages than that language in which a speech is made, for instance, in English and in German, whilst a speaker is lecturing in French. There are, therefore, no technical difficulties in the way of the International Union adopting English as the third official language in its Proceedings, but there is a material difficulty which, however, can easily be overcome with united effort and good will on both sides to come to a reasonable arrangement. I read in the "Electric Railway Bus and Tram Journal" that the President of the Inter-

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national Union is prepared to meet the British Associations half-way I may say that having the great honour to address you here in your own language, I have gone the whole way, and I would be extremely gratified to see at the next Congress at the Hague a larger British participation.

In the meantime, following closely on the recent Congress of the International Union at Warsaw, a further two days will be spent in Paris on October 21 and 22 next to study and to take part in experiments which are being made in that city on the subject of the regeneration of current. I am asked to state by our Vice-President, M. Mariage, who is President of the Public Transport Company in Paris, that the International Union will be only too pleased to welcome any representatives of British undertakings who would like to attend the Paris meeting, and I am asked to invite them to do so. It will be sufficient if those wishing to attend this meeting in Paris in October simply request the President of your Association to intimate to the General Secretary of the International Union of their wish to be present, and a formal invitation will gladly be sent to them.

EXPERIMENTS IN FRANCE IN REGENERATION CONTROL.

With your permission I will now say a few words with regard to regeneration. The regeneration of current has engaged the attention of technical experts, who admit that the kinetic energy of a vehicle or train may be lost. This loss represents 50 per cent. of the current required for actual working. That is why the International Union included in its programme for 1928 the examination and discussion of the problem. At that time two systems were tried, but the disadvantages of these equipments were excessive cost of the motors and accessories, the excessive weight of the equipments and the shocks in running and especially on gradients and at starting. The attention of the technical world was, however, attracted to this problem and we are pleased to be able to say that great progress has been made in the solution of the question. The account given at Warsaw by M. Bacqueyrisse of the Paris tramways, and the investigations of M. Lievre of the Marseilles tramways, bring facts to our notice, of which we are now able to measure the results. Without entering into the details of design of this motor, I will simply point out to you that in this compound inductor motor employed, an additional shunt flux at the commencement of the starting, with respect to the ordinary series flux, is successively suppressed and then inverted. By the use of this shunt flux at the time of the stoppage of the vehicle or on gradients, it becomes possible to secure a certain regeneration. Further, the different combinations of excitation permit of reduction to a minimum of the running steps on resistance. The truth of these statements will be confirmed by the registering control apparatus which will be demonstrated on the Paris tramways during the Paris Conference.

The reduction of the cost of energy is on the average 25 per cent., due to :—

1. (a) Reduction of the rheostatic losses at starting ;
   (b) Economical running at slow and constant speed ;
   (c) Recuperation on the declivities and when slowing down ;
   (d) Easy driving making a lesser call on the professional value of the mechanic ;
2. As a consequence, reduction of the cost of maintenance from the fact of a greater progression in the startings and in the brakings, and less wear of the mechanical braking parts and of the tyres.
3. Augmentation of the commercial speed ;
4. Electric braking ;
5. Low price of the equipment, light weight, and reduced space required.

It will thus be seen how interesting this matter is. I now have the pleasure to wish the greatest success for your Conference and prosperity to your Association.

**Mr. R. S. Pilcher** (General Manager, Manchester Corporation Transport) : I am sure we are very gratified to have M. de Lancker and M. de Backer with us to-day. I think it is the first time for many years that we have had in Great Britain representatives of the International Union, and I am sure it augurs very well for the future. I had the pleasure of attending the International Congress at Warsaw and had the great privilege of addressing the Congress in English. M. de Lancker has the advantage of me to-day, because he is able to come here and speak to us not in French but in our own language. We thank him very much for his invitation to Paris, and I hope the Executive will be able to make some arrangements for those members of the Association who wish to attend. We trust that our two Belgian colleagues will have an enjoyable visit here, and that this is merely the first of many similar visits to this country.

**Councillor I. Brassington** (Chairman, Manchester Transport Committee) : I also would like to impress upon the Conference the necessity for this country sending more delegates to the meetings of the International Union. At Warsaw I think there were one hundred delegates from France, while this country was only represented by our friend Mr. Pilcher, and a representative from Glasgow. There was a large representation from such small countries as Czechoslovakia and Yugoslavia, and from all countries of Europe, and it seems to me that it does not add to the prestige of Great Britain in the minds of the small European nations when there is such a small British representation at these International Congresses. I hope, therefore, that more towns in this country will send representatives to the Hague Congress of the International Union in two years time. It will be a tremendous advantage if, as M. de Lancker has intimated, the English delegates can sit at their desks at the Congress and listen to the speeches in their own language, whilst they are being delivered in French or German, and I hope that there will be a big representation from this country.

**AWARDS IN THE ESSAY COMPETITION, 1930.**

The President then presented the awards in the Essay Competition for 1930. The subjects of the essays and the names of the prize winners are as follow :—

(1) " What is the best basis for the comparison of the working costs of a transport undertaking, whether vehicle-mile, seat-mile, or other basis."

First Prize ; £15 and Silver Medal.

Miss Phyliss L. Blakemore, Correspondence Clerk, Wolverhampton Corporation Transport.

Second Prize ; £10 and Silver Medal :

Mr. Arthur Ernest Kitchen, Accounting Clerk, Leicester City Tramways and Motor Omnibuses.

(2) " The case for a controlled monopoly of passenger transport within a statutory area."

First Prize ; £15 and Silver Medal :

Mr. William John Bracken, Clerical Staff (Claims Department), Liverpool City Tramways.

Second Prize ; £10 and Silver Medal :

Mr. John Morgan Powell, Clerk, Pontypridd U.D.C. Tramways.

(3) " Is the present system of ticket check justified and are the statistics of different classes of tickets sold daily and weekly of sufficient value to the management, having regard to cost of compiling them."

Prize ; £10 and Silver Medal :

Mr. Edward Harry Mason, Outdoor Staff Supervisor, Manchester Corporation Transport.

(4) " Describe the organisation which you consider necessary for an omnibus undertaking of from 50 to 100 omnibuses : (a) traffic department ; (b) garage running staff ; (c) works or repair organisation."

Prize ; £10 and Silver Medal :

Mr. John G. Jeffrey, Driver, Glasgow City Transport.

(5) " What is the value of welfare work ? What welfare work should a transport undertaking develop ? To what extent should the management take part in such work ? What is the view of the rank and file towards welfare work ?

Prize ; £10 and Silver Medal :

Mr. John C. Stewart, Sub-Station Attendant, Glasgow City Transport.

(6) " Describe the lay-out and equipment for a garage for about 100 omnibuses."

Prize ; £10 and Silver Medal :

Mr. Herbert Heath, Wireman, Sheffield City Tramways and Motors.

**The General Secretary** mentioned that this was the first occasion on which a lady had taken a prize, and Miss Blakemore was given a specially hearty welcome. Referring to the prize awarded to Mr. Powell, the General Secretary remarked that Pontypridd was in an area that had been particularly hard hit by the trade depression, and the Council had decided that it could not afford to send a representative to the Conference. When it ascertained, however, that one of its staff had been awarded a prize in the Essay Competition, it decided to send Mr. Powell to receive his prize and, of course, to pay his expenses. The fact that a driver on the Glasgow City Transport system had also won a prize was brought to the special notice of the Conference, and those present signified their appreciation of the fact.

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The Conference was then adjourned, and the annual general meeting of the Association was held.

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## ANNUAL GENERAL MEETING OF THE ASSOCIATION

The minutes of the previous annual general meeting of the Municipal Tramways and Transport Association (Incorporated) held on September 12, 1929, and the minutes of the joint meeting with the Association of Municipal Corporations, held on January 23, 1930, were taken as read and adopted.

The Report of the Executive Council for the past year, a document of over sixty printed pages, was then submitted.

**Bailie P. J. Dollan** (Convener, Glasgow Transport Committee): I wish to refer to the paragraph in the report, which states that "In our opinion the enforcement of Sections 19 and 93 (Road Traffic Act) will put an end to the wide disparity in the wages and conditions of service of omnibus employees at present existing in various parts of the country." I desire to emphasise the importance of that reference, in view of what has been said here this morning, because, if the impression goes out from this Conference that we are in favour of what is called the equality of wages, it will make it very difficult for municipal authorities who have to compete against private companies to ensure that these private companies will increase their wage standards to the same level as those of municipal authorities throughout the country. I want to say here, as representing one of the largest transport authorities in the country, that we are heartily opposed to the view that you can run an efficient transport service by trying to bring down the wages of your employees to the lowest standard adopted in private industry to-day. The municipal organisations which are members of this Association represent some £90,000,000 of capital and employ 90,000 people, and I suggest that the municipal enterprise has made some progress, mainly because it has had some regard to the conditions of living of its employees. There is not a municipal transport concern in Great Britain to-day that is suffering because it has paid 4s. or 5s. a week more than private industry. Indeed, it is because we have been paying our employees a living wage that we have an efficient service. I know some exceptions to that, and perhaps what I have said will encourage them to improve their standard. In Glasgow we are paying a minimum wage of 50s. per week which, in my opinion, is as low as it ought to be; indeed, it ought to be increased if possible. I say that you cannot get an efficient omnibus driver at £2 10s. per week. One of the worst jobs in this country to-day is that of the man who has to drive a double-deck omnibus through a big city, and if you pay a policeman a minimum wage of £4 2s. per week rising to £5 3s., you ought to educate the community into the acceptance of the idea that a man who is driving a big vehicle continually in a crowded city and is responsible for the safety of sixty passengers, should be paid a wage which will relieve his mind of all economic worry and enable him to concentrate on his job. I know of instances of companies who pay their conductors 18s. or 20s. per week and compel them to work 60 or 70 hours a week and sometimes 78 hours. We are paying our similar conductors—women—55s. per week, and we are proposing to put on the same route that these people run, a service which will enable the public to travel for 3d., as against 4d. by the private company. On another route we are charging 4d., as against 10d., and on another route 3½d. as against 7d. On every one of these routes the fares we have fixed are remunerative and paying their way. If that can be done I see no reason why we should let the impression go out that the Association will stand for depressing the wage standard of the employees in our public services. I hope attention will be drawn to the fact that we desire the wages of the private employee brought up to our standard, and if that is done we have no need to fear private competition. We all know that on the managerial side of municipal transport we are handicapped because of the idea that we desire to cut down salaries. I believe that a municipal transport manager should have the best salary he can get in competition with private companies, but if you believe in low wages for your men you cannot pay the best price for your manager, and therefore I urge all municipalities to uphold the principle of paying their employees on a basis that ensures efficient service and a satisfactory standard of living.

**The General Secretary:** This Section was the subject of much consideration by a sub-committee on which Glasgow was represented. It was the outcome of much consideration and had received the imprimatur of the Council itself.

### Overhead Equipment Committee.

**The President:** I would now like to ask Mr. Harvey to say a word on what has been done by the Joint Committee on Overhead Equipment.

**Mr. L. E. Harvey** (General Manager and Engineer, Ilford Corportion Tramway): I do not think I have much to add to what is printed in the Report. I am pleased that it contains a statement of the work done by the Committee, and I think that will keep us a little more in touch with the whole of the members. If we can be of any use to any members in connection with any difficulties that may arise in their overhead work we shall be only too pleased.

The Report was unanimously adopted.

### New Honorary Members.

**The President:** As you will notice by the Report, we have elected two hon. members, and I am sure that will meet with the approval of the delegates. They have both rendered yeoman service to the Association. One is Mr. H. Mozley, who retired from the position of general manager of the Burnley Corporation Tramways on March 31 this year and the other is ex-Alderman C. Higham, who was President of the Association 1924–25, and who, at the conference in 1920, read a paper on Tramway Fares. Mr. Mozley has taken a very important part in the work of the Association; in 1916–17 he was President and at the conference in 1906 he read a paper on Car Brakes. He has also read a number of papers before the Managers' Section. I am glad to know that he is here to-day.

**Mr. H. Mozley,** who was given a cordial reception, said: I very much appreciate the very kind act of the Association in making me an honorary member, because it practically ensures that I shall never lose touch with you. Perhaps I am almost the oldest living transport officer in this country, for I date back 62 years. I have always appreciated the advantage of meeting my friends the managers and members of Committee. My earliest effort to obtain criticism of my work dates back to 1885 in Birmingham. I gave a paper there for the first time on experiences with steam traction. I have always derived great help in my work from my fellow managers, as well as from what I may call the lay members of the Association. I have the happy feeling that I have retired from my work with the best feelings of my fellow members in the Association. I believe also that I have the appreciation of my late employers and perhaps best of all the members of the staffs that I have had the honour to be associated with for 48 years. I shall watch with interest the developments that are taking place and which, perhaps, I have happily escaped, because you are now entering on a new period that the younger men should be able to tackle with much greater fervour than a man of my years and experience.

### Annual Accounts.

**Mr. A. R. Fearnley** (Hon Treasurer), in presenting the accounts for the year which showed a balance on the right side, referred to very great regret that the Council felt at the death of Mr. Blakeborough, who had been the auditor for eleven years. He was a most efficient and useful member and they deeply regretted his passing.

### Election of President and Vice-President.

On the motion of the President, seconded by Councillor A. M. Miller and supported by Sir John Timpson (Portsmouth); Councillor I. Brassington (Manchester); Alderman J. Bowes (Manchester); and Alderman W. Greenwood (Salford), the meeting unanimously elected Mr. R. S. Pilcher, general manager of Manchester Transport undertaking, President for the coming year.

On the motion of Mr. R. S. Pilcher, seconded by Alderman A. H. James (Birmingham), and supported by Councillor A. Davies (Wolverhampton), and Councillor R. Smith (Northampton), the meeting unanimously elected Alderman A. G. Ellaway (Birmingham) as Vice-President.

### Hon. Treasurer and Hon. Solicitor.

Mr. A. R. Fearnley (General Manager, Sheffield Tramways and Motors) was unanimously re-elected Hon. Treasurer and cordially thanked for his services during the past year.

Mr. F. H. C. Wiltshire (Clerk of Birmingham City Council) was unanimously re-elected Hon. Solicitor.

Mr. H. Moxon was elected auditor.

### New Members of the Council.

The election of Members of Council resulted as follows:—

Alderman W. Greenwood (Chairman, Salford Tramways Committee);

Alderman George Hill (Chairman, Burton-on-Trent Transport);

Mr. C. Furness (General Manager, Blackpool Transport);

Mr. C. Jackson (General Manager, Plymouth Transport);

Mr. C. Owen Silvers (General Manager and Transport Engineer, Wolverhampton).

The Conference then adjourned until the afternoon.

In the evening, members and guests, to the number of 403, attended the annual dinner of the Association at the Hotel Majestic. The President was in the chair, and the guest of the evening was the Minister of Transport, Mr. Herbert Morrison. A full report of the speeches after dinner is given on a later page.

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On Thursday morning the Conference was resumed at the Hotel Majestic, and the members listened with keen interest to the reading of a notable paper by Councillor Gledhill, the complete text of which is given in the following pages.

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# THE TRANSITION IN ROAD PASSENGER TRANSPORT, WITH SPECIAL REFERENCE TO THE CHANGES THAT HAVE TAKEN PLACE BETWEEN 1928-1930.

*By* COUNCILLOR A. H. GLEDHILL, J.P.

(Member of the Institute of Mechanical Engineers; Fellow of the Royal Statistical Society, and Fellow of the Institute of Cost and Works Accountants).

*Chairman of the Halifax Corporation Tramways and Motor Omnibus Committee.*

### Historical.

1. A dominant economic fact of our age is the development of the Transport Industries.

2. The nineteenth century saw a great advance in the transport of men and goods by the invention and development of the steam engine. The twentieth century is experiencing now a wonderful expansion in the transport of men and goods by the development of the internal combustion engine. The petrol engine has brought a new and ever increasing activity in the Transport Industry, and this will probably be accelerated in the next few years by the development of the crude oil engine.

3. In making a survey of the recent transitionary period, it will be advisable to trace briefly the historic records of progress, and we find such records in an admirably condensed form in the preamble to the second report of the Royal Commission on Transport, published in October, 1929.

### The Licensing law prior to 1930.
(Excluding the Metropolitan Area.)

4. In 1847 Parliament passed the Town Police Clauses Act "for consolidating into one Act certain provisions usually contained in Acts for regulating the police of towns." It is evident that by that year the use of the hackney carriage had become general, as there were included in the Act elaborate provisions relating to the licensing of these vehicles and of their drivers.

5. These provisions were, however, operative only when incorporated with a Special Act, and remained so for the next 28 years, during which period they were in fact incorporated with many Special Acts.

6. In substance they empowered the local authority obtaining the Special Act to license to "ply for hire" within the area of the authority "such number of hackney coaches or carriages of any kind or description adapted to the carriage of persons" as the authority might think fit.

7. By 1875 the need had arisen for a wider application of the powers contained in the Act of 1847, and its provisions were incorporated with the Public Health Act, 1875, thereby coming into force automatically in all boroughs and urban districts, and in such rural districts as might be brought within the scope of the legislation by an Order of the Local Government Board (now the Ministry of Health).

8. By 1889 the horse omnibus had become a popular type of vehicle and was used in sufficient number to lead to the passing of the Town Police Clauses Act of that year. This Act gave a special definition of an omnibus (the essential difference between a hackney carriage and an omnibus being that the former is hired as a vehicle whereas the latter is used for carrying passengers at separate fares), extends to omnibuses the appropriate sections of the Act of 1847, and empowers licensing authorities to make byelaws for certain specified purposes. Amongst these purposes, one finds that byelaws may be made for securing the fitness of the omnibus and the harness of the animals drawing it; for regulating the number and securing the fitness of the animals to be allowed to draw an omnibus, and for the removal therefrom of unfit animals. It is true that all the purposes for which byelaws may be made under the Act in question are not so covered by the cobwebs of antiquity as those instanced above. For example, there is greater need to-day for regulating stands and stopping places than there was 40 years ago, but the broad fact remains that the provisions of the Acts were drawn at a time when nobody could reasonably be expected to foresee the changes which the future was to bring forth, and, speaking generally, it is only by chance that any of these provisions are applicable in the circumstances of to-day.

9. Before the passing of the Ministry of Transport Act, 1919, which gave a right of appeal to the Minister, the only remedies available to an applicant whose application for a license to ply for hire had been refused, were either to appeal to Quarter Sessions, or to apply to the High Court for a Writ of Mandamus. So far as the first remedy is concerned, there does not appear to have been any case of an appeal to quarter sessions, and as regards the second, it is costly, and in practice, unsatisfactory owing to the principles of law applicable to all proceedings by way of mandamus. Briefly stated, the duty of the court was to see that the methods which the licensing authority had adopted and acted upon were correct, and not to criticise the conclusions at which they had arrived.

10. By the Roads Act, 1920, the appeal provisions of the Act of 1919 were re-enacted in a slightly altered form, to meet a point of difficulty which had been found to arise in practice.

11. Such was, in outline, the general law on the subject in England and Wales, enacted (except for the appeal provisions) at a time when only horse drawn transport with its limited radius of activity was known, and, until new legislation was passed, it was under the provisions of this law that any attempt could be made to regulate and control the modern public service vehicle, capable of high speed, with a range of activities limited only by the sea.

12. Although we do not consider it necessary to comment here in detail upon the general inappropriateness of these laws, there are three outstanding points which apparently gave rise to considerable practical difficulty, and which we think it right to mention specifically.

13. First, in spite of the fact that there were more than 1,345 licensing authorities in Great Britain, the licensing laws, such as they were, did not apply throughout the whole of the country. While licensing powers were exercisable within their respective areas by councils of boroughs and urban districts, only 65 rural district councils out of a total of 644 had been invested with these powers. This meant that there were large areas in which public service vehicles were not subject to any more control than other motor vehicles, and a number of areas where there was no control.

14. A short explanation of the small number of rural districts in which licensing powers may be exercised may here be given. It was not until after the War, that with the remarkable development of road services, the necessity for regulation was generally realised. In 1922 the then Minister of Transport appointed a Departmental Committee to consider and report to him upon the question of the regulation of road vehicles, other than trolley vehicles and trams, carrying passengers for reward. The Report of this Committee was published in 1925 and upon it was based Part IV of the Draft Road Traffic Bill. Meanwhile, many rural district councils who desired to be invested with licensing powers, made application for the necessary Orders. Although not always refused, these applications were discouraged by the Ministries of Health and Transport, because the subject of licensing was under consideration by the Departmental Committee, and later, in anticipation of legislation on the lines of the Draft Road Traffic Bill. The need for comprehensive legislation which would apply uniformly throughout the country was evident, but apparently lack of Parliamentary time prevented the introduction of such legislation.

15. Apart from the fact that the whole of the country was not covered by licensing authorities, it might be suggested that a moderately satisfactory control could be exercised over public service vehicles through those authorities which were empowered to grant licences and to make byelaws; however, this was not so. In the first place, the scope of the power to make byelaws was too limited, since the Act of 1889 made no mention of either routes or services. In the second place, the byelaw was not a proper or an appropriate method of exercising any general control over these

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vehicles. A byelaw is essentially local in character, and in the days when road transport services were also purely local, byelaws no doubt fulfilled all that was needful. But to-day the public service vehicle passes on its route through a number of different localities, and it seems to us unreasonable that during its journey this vehicle should become subject to several codes of byelaws.

16. The second point of difficulty related to the interpretation of the expression "plying for hire." The question as to whether a vehicle was or was not plying for hire on a particular occasion was one of fact, and although a number of judgments had been given on the subject, these decisions were so conflicting that sometimes grave doubt existed whether the owners of such vehicles were or were not infringing the law. As a result, it was often difficult to establish the facts of infringements, and it appeared to be legally possible for unlicensed omnibuses in certain circumstances to carry passengers for hire, as, for example, persons who happened to possess return or contract tickets.

17. The third point related to the ineffectiveness of the penalty for plying for hire without a license. For this offence a maximum penalty of 40s. could be imposed. When this amount was fixed it might have been adequate, but it was profitable for an operator to run and continue to run unlicensed vehicles, as the profits earned were greater than the fines inflicted. An instance has been given, where a certain proprietor and his servants were convicted no fewer than 62 times in eight months and in all but five cases were fined the maximum penalty, and notwithstanding this, still persisted plying for hire with the unlicensed vehicle.

18. The need for modern legislation for controlling road transport is evidenced by the following considerations:—

(1) The enormous increase in the number of road vehicles.
(2) The increased cost of road maintenance to provide suitable surfaces upon which those vehicles shall operate.

The following are the facts:—

A.—No of Licenses Issued.

| Year | (1) Cars | (2) Comm. goods vehicles | (3) Motor hackneys | Total of these (1) (2) (3) | Total receipts from motor licenses |
|---|---|---|---|---|---|
| 1922 .. | 314,769 | 158,856 | 77,614 | 551,239 | £11,339,117 |
| 1924 .. | 474,261 | 209,763 | 94,153 | 778,177 | £15,223,688 |
| 1926 .. | 683,913 | 247,334 | 100,645 | 1,031,892 | £18,934,223 |
| 1928 .. | 884,645 | 305,744 | 95,412 | 1,285,801 | £25,456,377 |
| 1929 .. | 980,645 | 329,794 | 97,997 | 1,408,436 | £26,250,769 |

B.—Cost of Roads.

| | |
|---|---|
| 1890–91 .. .. .. .. | £8,670,000 |
| 1902–03 .. .. .. .. | £14,646,000 |
| 1909–10 .. .. .. .. | £15,288,000 |
| 1930 .. .. .. .. .. | £56,000,000 |

C.—Annual number of cars and commercial vehicles manufactured.

| Year | Cars | Commercial | Total | No. of employees |
|---|---|---|---|---|
| 1907 .. | — | — | 12,000 | 34,000 |
| 1924 .. | 116,600 | 30,000 | 146,600 | 224,490 |
| 1927 .. | 164,553 | 47,227 | 211,780 | 254,980 |
| 1929 .. | 182,347 | 56,458 | 238,805 | 271,325 |

It will be agreed, that road transport should pay its fair share of the extra cost in road maintenance due to the increased amount of traffic, but the tendency of the last few years has been to place an excessive burden upon one form of transport, namely, motor transport. This has been carried out in two ways, first, by an increase in the tax on hackney carriages and secondly by the re-introduction of the petrol tax at the rate of 4d. per gallon, which was estimated to yield £13,600,000 per annum.

Whatever may be the merits or demerits of derating, it was very unfair to the motor industry to transfer such a burden of taxation from the whole of the manufacturing community and place it upon a single industry, and any tax which is levied on motor transport in excess of the actual extra cost of maintaining the roads due to that transport, is unfair victimization of a particular industry. If we take the annual cost of maintaining the roads at a figure of 56 million pounds over the last four years, we find that the amount contributed by motor vehicle taxes has increased in the same period from 18 millions to 26 millions, and in the last year we have to add to this 13½ million pounds in petrol tax, making a total contribution of 39½ millions last year as against 18 millions 4 years ago. There can be no justification for such an enormous increase in taxation on one particular industry.

There is another point which seems to have escaped the notice of our taxing authorities and that is the fact that the enormously increased weight of traffic upon the roads has placed an increased burden upon Tramway undertakings, due to the fact that they have to maintain road surfaces for the width of the track plus 18 in. at each side. The tramway operators in this country have a very sound argument for demanding that some portion of the yield from the tax levied upon motor transport should be distributed to the Tramway undertakings as a contribution towards the increased cost of maintaining their portion of the roadway. In the early days of the tramways many municipalities borrowed for track construction on a term of years much longer than the useful life of the track. To-day we are faced with a greatly increased cost for track renewal due to the higher rate of wages and material, and at the same time have to redeem this cost in a shorter term of years and at a rate of interest on money nearly double that of pre-war. All these factors operate in one direction, and there are none to cancel out, hence the cost of track renewal inflicts a charge upon the undertaking for a term of years in the neighbourhood of three or four times the cost per mile compared with pre-war figures. Unless some contribution is forthcoming towards this heavy charge, the tramways undertakings will be severely crippled in their operations.

19. This rapid development in road transport has become a serious challenge to municipalities and railway companies. A capital expenditure of over eighty million pounds has been invested in tramway undertakings and £1,222,581,206 in railways. It would be a national disaster if unrestricted motor omnibus competition were to be allowed to proceed in such a way as to make this great invested capital unremunerative.

20. Several municipalities and some companies obtained from Parliament special Acts to protect their tramway interest. For each to have applied separately for such powers would have been a very costly procedure, and for this reason this Association introduced the Omnibuses Bill with the object of obtaining powers in a general Act of Parliament.

21. The former L. & N.W. Railway Company promoted a Bill for securing road powers in 1922, and the Parliamentary Committee reported in their favour, but the Bill was withdrawn.

22. No further attempt was made until 1928 when the group railway companies promoted their Road Transport Bills. It was obvious that logic was on the side of the railway companies and that they would ultimately obtain Road Transport powers of a wide character.

### The Railway Position.

23. The views of the railway companies in regard to road transport may be gathered from extracts of the evidence which was submitted to the Joint Select Committee of the Lords and Commons when considering the Railway Companies' Bills for extended powers in regard to road transport.

24. Sir Josiah Stamp, Chairman of the L. M. & S. Railway Company, said there were two cardinal matters which affected the railway position. These were the operations of the Railways Act, 1921, with particular reference to the attainments of the standard revenue; and the new feature introduced by the free and untramelled competitor. These two matters were inter-related in an extraordinary manner, and the attaining of the standard revenue by the Railway companies tended to be jeopardised by the competition of road transport, the effect of which would be to handicap increasingly the railway companies in the raising of ordinary share capital and that the continual transference of railway traffic to the roads had depleted the railway revenue and threatened to disturb the bargain reached under the Act of 1921. It would also be possible where a railway line served a series of authorities, and each village was some way from the station, to carry the traffic by road and thus free the railway companies from slow services between the local stations.

25. Some interesting figures in regard to the effect which the increased road transport had upon the Railway returns was given by Mr. James Milne, Assistant General Manager to the G.W.R., who stated that in 1923 the number of passengers carried over the lines of the company was 124 millions odd, and the number in 1927 was 112 millions odd, a drop of 12 millions in four years. That was also coincident with an increase in the number of train miles run. The Company had been giving more and more cheap fares and excursion fares in order to retain the passenger traffic, and the result was that the proportion of passengers carried at full fare had gone down from 45 per cent. to as low as 24.79 per cent. in 1927.

26. Other evidence of the loss sustained by the railway companies was given by Mr. C. R. Byrom, the chief general superintendent of the L.M. & S. He stated that in the Sheffield area the loss in receipts on the short journeys was 94.37 per cent. and the percentage loss on the whole of the area comprising 200 miles of line and including 24 stations was 29.56 per cent. He also gave statistics showing the effect of omnibus competition on passenger bookings at Steeton and Silsden. In February, 1925, there were

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26,609 passenger journeys, and in 1927 this had been reduced to 7,167, and in 1928 to 4,777.

27. The notion of the railway being a highway for the common use of the public in the same sense as an ordinary highway was the starting point of English railway legislation. It is deeply engrained in it. The first Act that authorised the railway company to use its own locomotives and its own vehicles on its own railroads was the G.W. Act of 1833, and the first General Act was in 1838 which applied to the conveyance of mails. Then there were the two Regulation Acts of 1840 and 1842, and the Railway Clauses Act of 1845 which is the important Act. Parliament authorised them to engage in the construction of railways and the conveyance of passengers and goods over these railways, but in conferring these privileges added the condition "As no one else will have the same powers as you will have in the particular district where we give you these powers, we must prevent the possible abuse of those powers by placing you under certain obligations designed to prevent the abuse of the monopoly which we are conferring upon you."

28. In 1873, there was set up a special body of railway commissioners, and to them was delegated the duty of dealing with any questions which arose in regard to the carrying on of the railways. They heard complaints and discussed and disposed of them. This was a special tribunal set up for the purpose.

29. Then followed an Act of very great importance—the Act of 1888 called the Railways and Canals Traffic Act. That Act was really the basis of modern legislation. What was probably one of the most important enactments was Part 2 "Traffic," which reads, "Notwithstanding any provision in any General or Special Act, every railway company shall submit to the Board of Trade a revised classification of merchandise traffic and a revised schedule of maximum rates and charges applicable thereto, proposed to be charged by such railway company and shall fully state in such classification and schedule the nature and amounts of all terminal charges proposed to be authorised in respect of each class of traffic, and the circumstances under which such terminal charges are proposed to be made."

30. Mr. Macmillan, K.C., in opening the proceedings before the Joint Select Committee of both Houses of Parliament, on the group Railway Bills which proposed to confer road transport powers in 1928 upon the companies, pointed to a remarkable contrast:—"We are allowed, you observe, to give road services in respect of goods if these goods have been carried on the railway or are about to be carried on the railway; on the other hand, when we provide, as we are entitled to provide, services by sea, Parliament has expressly said that we are not entitled to differentiate against the person who has not come from the railway, but that we shall be bound to take persons who present themselves at the pier, and we are not entitled to ask them 'Have you come by railway?' In short, Parliament said 'You must not discriminate; you must give those services to all and sundry, and any person or persons presenting themselves to your steamers must be entitled to go by your steamers,' and yet we are in the ridiculous position that to any person coming to us on our road services with goods, we have to say 'No, we cannot take your goods unless they are going to be railway borne.'"

31. The Railway "Road Transport" Acts of 1928 are by far the most important of recent measures in the transition of transport, and the hope of the railway companies is undoubtedly that they will be able to expand their motor transport interests to such an extent as to counterbalance the diminution of their railway traffic. The most serious problem facing the financial advisers of the railway companies at present, must be how to restore the income in respect of an invested capital outlay exceeding one thousand two hundred million pounds by, say, one hundredth part of that amount, or twelve million pounds of expenditure, upon road transport development.

32. The local authorities did not regard the movement with equanimity. Since many local authorities have invested large capital sums in tramways and omnibus undertakings, sometimes at great profit, sometimes with a narrow margin of remuneration, and occasionally at a loss, they are naturally concerned at the prospect of the rich and powerful railway companies entering into competition with them in their own areas where they had established transport facilities.

33. Their opposition was not on a question of principle but merely to secure that their interests were adequately safeguarded.

34. The chief point at issue was the *extent* to which they should be protected from unnecessary competition. Some argued that protection should be limited to within the actual areas of the local authority. Others thought that protection should be extended beyond the boundaries, since many towns provided transport services outside their particular limits, either to connect themselves with adjacent towns or to carry workers to and fro. (The Halifax Corporation provided passenger transport facilities for no fewer than eleven outside authorities.) It was claimed that the services inside and outside the borough were part and parcel of one undertaking, therefore there was no reason for dividing the services into two parts, the one protected and the other unprotected.

35. This Association considered that the Bills should be opposed unless the railway companies gave a definite assurance that they would not use their powers to establish competitive services traversing the same routes as tramways, motor vehicles and motor omnibuses, established by them under statutory authority.

36. Whether or no the change involved by these Bills was popular with municipal authorities, it was obviously fair that the railway companies, with their great responsibilities for the efficiency of national transport, should be protected against ever-growing competition. It would be disastrous if the Railways, as a result of the traffic loss owing to competitive road services, should become so impoverished as to render them ineffective and unremunerative.

### The Municipal Tramway Position.

37. The advent of the motor omnibus quickly changed the position of municipal tramway undertakings from a closed monopoly or sheltered industry to an exposed and unsheltered one. This competition has become so severe that some tramway undertakings are not earning their working expenses and debt charges. To relinquish tramways would involve a considerable loss of capital amounting to some millions of pounds and would create a serious position for the travelling public, particularly the working classes, who are largely dependent upon this means of transport for travelling to and from their work at the cheap fares imposed upon the undertakings by Special Acts of Parliament.

38. In considering the question of competition between omnibuses and tramways it must be borne in mind that the tramway undertaking is operating under specific statutory authority, and that Parliament in giving sanction to the undertaking imposed heavy obligations upon the undertakers, which do not apply to their competitors on the routes, such as conveying the workmen during certain hours at cheap fares, maintaining the roadway between the tramway tracks and 18 in. on either side of the outer rails, and bearing heavy capital charges for street widening as a condition precedent to the construction of their tracks. Further, they have to pay rates upon a basis of their gross earnings. If the tramways are to be put out of business by unrestricted competition, very heavy charges will fall upon the highway authority and ultimately upon the ratepayers and the Road Fund.

39. Non-municipal motor omnibus operators naturally sought the most paying routes and proceeded to operate in competition with tramways, which until then were providing all the travelling facilities required within their traffic areas. In addition to these licensed operators, a number of unlicensed pirate omnibuses have been placed on the roads in many towns at the peak traffic hours, and as these services are not bound by any regulations as to timetables they are able to conduct a profitable business, taking the "cream" from the tramway undertaking, and leaving the tramways to run the services during the slack non-paying hours of the day.

40. The Parliamentary powers given to municipal authorities to run transport services were in many cases confined to the limits of their own boundaries, and even where tramways extended beyond such boundaries the municipal authority was not legally entitled to run motor omnibuses in competition with such operators over their own tramway track. Some cities and towns have secured powers to run outside their own boundaries, but the process of promoting a Parliamentary Bill is so slow that by the time the powers have been obtained independent operators have secured the traffic, and not only the traffic but the goodwill of the travelling public in the areas over which they operate. The independent operator has been praised for his foresight and energy and the municipal authority has been blamed for its lethargy, when the latter was absolutely restricted by Parliamentary powers, and fighting a battle with its hands tied behind its back.

41. To remove this disability the Association promoted the Omnibuses Bill (which will be referred to later) for the purpose of securing powers in a General Act of Parliament applicable to all local authorities, thus saving time and money which would be involved if each authority promoted a separate Parliamentary Bill.

### The Licensing Position.

(Prior to the passing of the Road Traffic Act, 1930.)

42. The 1,345 licensing authorities in Great Britain enabled almost anyone to obtain a licence in some place or other to run a motor vehicle, and in consequence in many places the congestion on the roads increased by unnecessary vehicles, which by running in advance of regular services and tapping their traffic, caused the

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regular services to be unremunerative; also racing and cutting-in took place to the serious danger of the public. Further, by skimming the cream off the best paying routes they prevented the regular operators from providing services on less remunerative routes, thereby depriving a section of the public of facilities. In addition, there was no thorough inspection of these public service vehicles, with the result that there were undoubtedly an appreciable number of vehicles on the road in an undesirable condition, if not actually unfit for use. The result was confusion, congestion and conflict.

43. Municipal authorities, even with powers to run outside their borough boundaries, had to secure licences from all outside authorities, large or small, through whose districts they travelled, and also had to receive the consent of the County Council when they were the road authorities. In some cases the county councils refused consent to grant a licence to a municipality unless that municipality would agree to grant licences in their area to any motor omnibus owner applying from a rural area, and although such an imposition was in many cases unreasonable, the local authority was placed in the position of accepting such a condition, running without licences, or not running the services at all.

44. It was becoming more and more obvious that in the absence of legislation, local authorities were being increasingly attacked by long-distance services, which, little by little, line by line, were by their through-town services, worming themselves into shorter-distance services, with very little consideration in many cases by the licensing authority for the interests of the existing services which satisfied the needs of the district.

The regulation of long-distance services by individual local authorities was impossible. The judgment in the Burnley case heard in the Divisional Court on March 27, 1930, made that point clear.

It is worth while calling attention to the fact that during the eight years following the passing of the Roads Act, 1920, there were no fewer than 844 appeals to the Minister of Transport by persons or undertakings whose applications for licences to ply for hire with omnibuses had either been refused by the licensing authority, or had been granted subject to conditions, all of which proves that a regularized system of control as embodied in the Road Traffic Act was a vital necessity.

Local authorities will be relieved that the vexed question of "Plying for hire" has once and for all received its quietus by the Act of 1930.

45. As an example of the injustice of the position I will quote a local case. The Rochdale and Halifax Corporations desired to run through services on a 50/50 basis from Rochdale to Halifax. These services were actually run for several months, when the West Riding County Council threatened the Halifax Corporation with an injunction unless they ceased running the services. The local Parliamentary powers at that date did not provide for an appeal to the Ministry of Transport in cases of disagreement between the local authority and the county council, and the Halifax Corporation had to withdraw their participation in this joint working.

46. In consequence of this and other disabilities under which the Halifax Corporation were placed by their existing powers, they applied to Parliament for:—

(1) A Bill giving them powers to run motor omnibuses along all tramway routes outside the borough, plus eight other specified routes outside the area of the tramway routes, some of which had been the subject of opposition by the county council.

(2) Powers to appeal to the Ministry of Transport in case a local authority withheld consent unreasonably.

(3) Powers to substitute a service of motor omnibuses along any tramway route and to discontinue the running of tramcars along such route or part thereof.

The Parliamentary powers thus obtained placed the Corporation in a much more satisfactory position in regard to motor omnibus operation.

47. The whole position of the existing licensing conditions in 1929 was admirably summed up in Paragraph 84 of the Second Report of the Royal Commission on Transport, which read as follows:—

"As a result of our deliberations we have unanimously come to the definite conclusion that, as modern road passenger transport has grown to such importance (an importance which is certain to increase) the present chaotic system of licensing, which is based upon obsolete laws passed long before mechanical traction existed, must disappear and be replaced by an entirely different system more suited to present-day needs."

And Paragraph 92 of the same Report, as follows:—

"We are in complete agreement with the principle of large traffic areas—indeed, we fail to see any other practical and satisfactory alternative—and, following upon the general conclusion at which we have arrived, we recommend that for the purposes of the licensing of public service vehicles and the co-ordination of all passenger-carrying services, Great Britain shall be divided into Traffic Areas."

These recommendations have been embodied in the Road Traffic Act, 1930.

### Joint Working Agreements between Railways and Municipalities.

48. Shortly after receiving their road powers, the railway companies approached a few municipalities in regard to joint working of motor omnibus services. The Halifax Corporation appointed a special committee in September, 1928, with powers to negotiate a joint working agreement with the railway companies. Similar negotiations were entered into by the Sheffield Corporation, and the latter Corporation commenced operations under the joint working scheme on January 1, 1929, but the terms of the Agreement were not finally settled on that date. The Halifax Corporation deferred their commencing date until the Agreement was in proper form for acceptance by both parties, and in consequence the Halifax Agreement was the first to be completed and signed, and the joint running commenced as and from April 1, 1929.

The main clauses in the agreement are as follow:—

(1) All omnibus services within the borough to be operated by the corporation.

(2) Joint working with the railway companies of omnibus services within the prescribed area outside the borough.

(3) Long-distance services beyond the territory of these two areas to be operated entirely by the railway companies or their nominees.

(4) Protection to be given to the Halifax Corporation Tramway undertaking, both inside and outside the borough.

(5) The Joint Committee to receive into their pool, fares for all passengers who are picked up and set down by the long-distance omnibuses within the sphere of the joint operations, less working expenses.

The constitution of the Joint Committee is as follows:—

Four representatives elected by the Municipal council, and four representatives elected by the railway companies (in the case of Halifax, two from L.M. & S., and two from L.N.E.R.). The Chairman of the Joint Committee to be elected annually, the first year from the Corporation representatives and the second year from the railway representatives, and thereafter alternately. The author had the honour of being elected first Chairman of the Halifax Joint Committee, and for the current year the Chairman is Mr. Ashton Davies, of the L.M. & S.

### The Omnibuses Bill, 1930.

49. A full report of the proceedings in connection with this Bill is issued in the Annual Report of the Council, so that I need not refer, except briefly, to its provisions. The purpose of the Bill was to empower the Ministry of Transport, by Order, to authorise local authorities who have obtained Parliamentary powers to operate either tramways, trackless-trolley omnibuses, or motor omnibuses, to operate motor omnibuses both within and outside their own areas, subject to certain consents. The Minister of Transport expressed his readiness to assist local authorities possessing transport powers to obtain some simpler and less expensive method of obtaining omnibus powers—both within and outside their own areas—than that of Private Bill legislation.

The Royal Commission reported favourably on Part V of the Bill as amended by the Minister of Transport, stating that the result would be to place those local authorities, who at present possess limited powers to provide transport services, in a position of equality with other operators when applying for a licence to the Traffic Commissioners, and it should further enable such authorities to substitute omnibus services for tramways if they considered it to be in the public interest so to do.

I must refer the Members of the Conference to paragraph XV of the Report of the Council in which the proceedings relating to the Omnibuses Bill and the Road Traffic Bill are explained at length.

### The Road Traffic Act, 1930.

50. Following the Report of a Departmental Committee on the subject in 1925, a draft Road Traffic Bill was produced by the Ministry of Transport. This was considered by the Royal Commission on Transport appointed in 1928, and following the Reports of this Commission, the final draft of the Road Traffic Act was produced.

The Road Traffic Act:—

(1) Divides public service vehicles into three classes, Stage carriages, Express carriages, and Contract carriages.

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(2) Sweeps away the present Licensing authorities, divides England and Wales into 11 Traffic Areas, sets up over each of these areas three Traffic Commissioners who will issue as they think fit to applicants public service vehicle licences and road service licences. Section 63 (3) of the Road Traffic Act provides the machinery for appointing Commissioners, as follows :—

"One of the Commissioners shall be appointed by the Minister from a panel of persons nominated by the councils of the counties whose area, or any part of whose area, is situated in the traffic area, another of the Commissioners shall be appointed by the Minister from a panel of persons nominated by the councils of the county boroughs and urban districts whose area, or any part of whose area, is situated in the traffic area, and the other Commissioner shall be such person as the Minister thinks fit to appoint to be Chairman of the Commissioners."

(3) Establishes a standard of wages and conditions of employment for those engaged in the industry, which will remove the unfair competition now facing municipal operators.

Upon this point of standard wages it is well to remember that on July 11, 1929, the National Council decided to make representations to the Minister of Transport, urging the importance and necessity of imposing, as a condition of granting licences for motor omnibuses, the observance of the rates of pay and conditions of service operating in the district concerned, and actually appointed a deputation for the purpose.

At the next meeting, held on October 17, 1929, the Council was informed that the Conference of Tramways and Light Railway Companies could not be parties to the deputation, and there the matter dropped. It is only necessary to compare this position of impotence, resulting from the attitude of the Companies (most of which operated motor omnibuses) with the conditions laid down in Section 93 of the Road Traffic Act, 1930, imposing upon operators the "fair wages resolution" of the House of Commons, set forth on page 30 of the Report of the Council, to realise just how far we have travelled within a period of thirteen months.

51. The Road Services Licences will authorise an operator to provide motor omnibus services along certain routes. These licences will have to be backed by the Commissioners for each area for which they are valid. The Commissioners will thus be able to prevent overlapping of services and excessive fares and speeds.

52. Drivers and conductors will also have to be licensed by the Commissioners, and no public service vehicle license will be issued unless a certificate of fitness has been produced for the vehicle concerned. Public Service Vehicle Examiners will issue these certificates of fitness. The Commissioners will be able to suspend licences if the vehicles develop defects or the proprietors do not comply with the conditions under which licences are issued.

53. In general it may be said that the Road Traffic Act, 1930, completely regularises the control of public service vehicles and the routes on which they run.

The Act also gives general powers to all local authorities already authorised to run trams, trolley vehicles or omnibuses, to run public service vehicles outside, as well as inside their own districts, with the consent, within the limits defined by the Act, of the Traffic Commissioners.

54. The past three years have witnessed such important developments with regard to passenger transport on the roads that any forecast must necessarily be rather speculative. The chief factors are :—

(1) The railway companies have obtained road transport powers.

(2) That municipalities and railway companies are showing a tendency to co-operate in providing passenger services on the roads.

(3) That the country is to be divided into eleven traffic areas, each presided over by three more or less independent Traffic Commissioners.

(4) That municipalities are to be given general powers to run motor omnibuses outside as well as inside their areas, with the consent of the Commissioners, and within limits defined by the Act.

Of these four revolutionary changes, only the effect of (1) has yet begun to be felt, accentuated by all manner of irregular competition.

In future, the Minister of Transport, through the Traffic Commissioners, will completely dominate the public service vehicles policy of the country. To them, municipalities, railway companies, and road-motor companies will submit their claims to provide services on certain roads, which will be considered on their merits, so that the services shall, as far as possible, be such as to provide the maximum benefit for the general public.

55. The tendency will be, presumably, for the smaller non-statutory undertakings to drop out as separate entities, and passenger transport on the roads will become more and more a controlled monopoly shared by the municipalities, railway companies, and large road transport companies.

56. Whilst the municipalities may be in a favoured position as regards control of passenger services within their own boundaries, the Railway companies will undoubtedly press ahead more and more with a comprehensive system of motor omnibus routes and time tables connected with their rail services.

57. Although barely two years have elapsed since the railway companies obtained road transport powers, already they have a part interest in 14,000 big motor coaches throughout the country. (The total number of public service motor vehicles at present in this country is about 63,000).

58. The railway companies have now expended £7,500,000 in obtaining shares in road transport undertakings. Already motor coaches partly owned by them carry half as many passengers per year as are carried on the railways. The railway companies will presumably make further headway in this connection after the Traffic Commissioners have been set up.

### Railway Companies' Amalgamations and Mergers: Joint Working Agreements.

59. Since the passing of the Group Railway Companies' Road Transport Acts (1928) up to date (July, 1930) the following amalgamations have been made by the Railway Companies :—

LONDON, MIDLAND AND SCOTTISH RAILWAY.

| Associated Road Company. | District Covered. |
|---|---|
| Ayrshire Pullman Service. | Ayr, Girvan and Newton Stewart. |
| Birmingham and Midland Motor Omnibus Co., Ltd., incorporating Black and White Motorways, Ltd. (Jointly with Great Western Railway.) | Staffs., Leicestershire, Warwickshire, Worcestershire, Herefordshire, Salop, Oxon and Northants. |
| Crosville Motor Service, Ltd., incorporating Llandudno Coaching and Carriage Co., Brookes White Rose Services Rhyl, U.N.U. Motor Services, Carnarvon, Mona Maroon Services, Holyhead. | North and Central Wales, Anglesey, Chester, Wirral, Liverpool, Warrington, Northwich, Crewe, Whitchurch, etc. |
| Cumberland Motor Services. | Cumberland. |
| Greenock Motor Co. and L.M.S. Joint Omnibus Services. | Between Glasgow, Greenock and Largs. |
| Highland Transport Co., Ltd. | Inverness, Dingwall, Dornoch, etc. |
| L.M.S. and Mansfield and District Tramways Co. (Joint Service). | Mansfield, Southwell and Newark. |
| Ribble Motor Services, incorporating Rishton and Antley Motor Co. | Liverpool, Wigan, Bolton, Manchester and northwards to Carlisle. |
| Furness Omnibus Co., Ltd. | Barrow, Windermere, etc. |

L.N.E. AND L.M.S. JOINTLY.

| Associated Road Company. | District Covered. |
|---|---|
| East Midland Motor Services, Ltd. | Derbyshire, Nottinghamshire, and Yorkshire. |
| Lincolnshire Road Car Co., Ltd. | Lincolnshire and Nottinghamshire. |
| North Western Road Car Co., Ltd. | Cheshire and Derbyshire. |
| Ortona Motor Co., Ltd. | Cambridgeshire. |
| Peterborough Electric Traction Co., Ltd. | Cambridgeshire, Huntingdonshire and Norfolk. |
| Trent Motor Traction Co., Ltd. | Nottinghamshire and Derbyshire. |
| West Yorkshire Road Car Co., Ltd. | Yorkshire. |
| Yorkshire Traction Co., Ltd. | Yorkshire. |
| Yorkshire (Woollen District) Electric Tramways, Ltd. | Yorkshire. |
| Eastern National Omnibus Co., Ltd. | Essex and Bedfordshire. |
| Scottish Motor Traction Co., Ltd. incorporating - | Scotland. |
| W. Alexander and Sons, Ltd. | Scotland. |
| Scottish General Omnibus Co., Ltd. | Stirling, Fife, Lanark. |
| Scottish General (Northern) Omnibus Co., Ltd. | Aberdeen, Nairn, Inverness. |
| Simpsons and Forresters, Ltd. | Stirling, Fife, Kinross. |
| Pitlochry Motor Co., Ltd. | Perth, Ayr. |
| General Motor Carrying Co., Ltd. | Fife, Perth, Stirling, Lanark. |
| Midland Bus Services, Ltd. | Scotland |
| Hebble Omnibus Services. | Yorkshire. |

LONDON AND NORTH EASTERN RAILWAY.

| Associated Road Company. | District Covered. |
|---|---|
| Eastern Counties Road Car Co., Ltd. | Norfolk and Suffolk. |
| East Yorkshire Motor Services, Ltd. | Yorkshire. |
| Northern General Transport Co., Ltd. | Northumberland and Durham. |
| United Atomobile Services, Ltd. | Northumberland, Durham, Yorkshire, Lincolnshire, Norfolk and Suffolk. |

Corporation Omnibus Undertakings in which the L.N.E. and L.M.S. have jointly acquired an Interest.

| | |
|---|---|
| SHEFFIELD | Yorkshire, Lancashire, Lincolnshire and Derbyshire. |
| LEEDS | Yorkshire. |
| HALIFAX. | Yorkshire. |

L.M.S. ONLY.

| | |
|---|---|
| HUDDERSFIELD. | Yorkshire. |

GREAT WESTERN RAILWAY.

| Associated Road Company. | District Covered. |
|---|---|
| Western National Omnibus Co., Ltd. | Devon and Cornwall—south of a line from Newquay to Exeter; also parts of Somerset, Gloucestershire, Dorset and Wilts. |
| Western Welsh Omnibus Co., Ltd. | South Wales—south of a line from Aberayron to Hereford. |
| Devon General Omnibus and Touring Co. (jointly with Southern Railway). | Devon. |
| Bristol Tramways and Carriages Co., Ltd. | Bristol district. |
| City of Oxford Motor Services, Ltd. | Oxford district. |
| Birmingham and Midland Omnibus Co., Ltd. (jointly with L.M.S.) | Staffs., Leicestershire, Warwick, Worcester, Herefordshire, Salop, Oxon and Northamptonshire. |
| Wrexham and District Transport Co., Ltd. | North Wales north of a line from Aberayron to Hereford. |

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SOUTHERN RAILWAY

| Associated Road Company. | District Covered. |
|---|---|
| Aldershot and District Traction Co., Ltd. | West Surrey and East and North Hants. |
| Devon General Omnibus and Touring Co. Ltd. (jointly with G.W.R.). | East and South Devon. |
| East Kent Road Car Co., Ltd. | East Kent. |
| Hants and Dorset Motor Services, Ltd. | South Hants and East Dorset. |
| Maidstone and District Motor Services, Ltd. | West Kent and East Sussex. |
| Southdown Motor Services, Ltd. | Sussex and East Hants. |
| Southern National Omnibus Co., Ltd. | Dorset, Somerset, East and North Devon and North Cornwall. |
| Southern Vectic Omnibus Co., Ltd. | Isle of Wight. |
| Wilts and Dorset Motor Services, Ltd. | Salisbury and District. |

### Motor Omnibus Accounts and Statistical Records.

60. Prior to the Road Traffic Act, which received Royal Assent on August 1, 1930, no non-statutory operator of omnibus services was required to make any returns, either of finance or statistics, to the Ministry of Transport, and therefore, it is not possible to obtain any authoritative figures with regard to the capital at present invested in road transport services by other than local authorities, nor of any statistics relating to passengers, and so on.

61. A standard form of accounts for motor omnibuses was prepared last year by this Association in co-operation with the Institute of Municipal Treasurers and Accountants. This form is of voluntary application only, but it is being generally applied as was the standard form of accounts for tramways, prepared in 1908.

62. The voluntary element is now terminated. Section 74 of the Road Traffic Act enacts that :—

(1) " It shall be the duty of any person carrying on the business of operating public service vehicles to keep such accounts and records in relation thereto and to make to the Minister such financial and statistical returns and in such manner and at such times as the Minister may from time to time require."

(2) " If any person fails to comply with the provisions of this section he shall be liable to a fine not exceeding twenty pounds, and in the case of a continuing offence to a fine not exceeding five pounds for every day during which the offence continues."

The whole question of returns will be controlled by the Minister, who will issue an Order under this section setting out the information that he requires. Henceforth, a return will be issued annually by the Minister, which should be interesting.

63. It has been the custom for many years with tramways undertakings to express the working expenses as a unit cost per mile, and since the average speed per hour of tramways has varied very slightly, the mileage basis has been generally acceptable for comparison of working costs throughout the country.

64. I venture to submit, however, that this basis will not be a satisfactory comparative basis for motor omnibus statistics. The mileage run is a product of the number of hours worked multiplied by the speed per hour, and so long as these two quantities remain fairly constant, as they do at present in tramway undertakings with all operators, a comparison of statistical results is fairly reliable. There is, however, a tremendous variation in the average speed of motor omnibuses.

65. Omnibuses working in a congested town or city area, will have much slower average speed than omnibuses operating in less congested areas, and these again will have a lower average speed than omnibuses operating on long-distance routes.

66. The average receipts per mile and the average working costs per mile are obtained from three variable factors—money, duration of hours of service, and speed per hour. The wages of drivers and conductors alone constitute in many undertakings roughly 25 per cent. of the working expenses, and assuming the wages of a driver and conductor to be 27d. per hour it follows that the cost of their wages per mile will vary widely, as example hereunder :—

Wages of driver and conductor 27d. per hour.
Average speed per hour in congested area—9 miles.
Cost per mile in wages—3d.
Wages of driver and conductor 27d. per hour.
Average speed per hour in long distance run—27 miles.
Cost per mile in wages—1d.

67. The working expenses of motor omnibuses may be divided under three headings :—

(1) Variable expenses in direct relation to mileage, and which give a constant expense ratio per mile run.

(2) Variable expenses paid by the hour, the cost per mile ratio of which is inversely proportional to speed.

(3) Fixed expenses which are a yearly charge upon the undertaking, independent of time or distance, the cost per mile ratio of which is inversely proportional to total yearly mileage.

Under heading (1) would fall such items as :—Tyres, petrol, oil, repairs and maintenance.

Under heading (2) would fall such items as :—Drivers' and conductors' wages, fares collection and ticket inspection, National insurance (on wages other than those charged to general repairs and maintenance).

Under heading (3) would fall such items as :—Road licences and drivers' licences, uniforms, garage rent, rates and taxes, management expenses, etc.

When the working expenses are analysed under these headings it will be found that approximately 50 per cent. of the total expenses fall under heading (1) and are directly proportional to the mileage run. 37½ per cent. fall under heading (2) and are inversely proportional to speed per hour, and 12½ per cent. are general overhead expenses independent of time or distance, and inversely proportional to the total mileage run per annum. (These percentages may vary within limits of about 5 per cent. in various undertakings).

For example. The annual licence duty does not vary whether a motor omnibus runs 20,000 miles or 50,000 miles per annum. Assuming a licence duty of £120 per annum for a motor vehicle, that would give a cost on a 20,000 mileage of 1.44d. per mile, and on a 50,000 mileage of 0.576d. per mile. It follows, therefore, that if statistics are to be comparable with any degree of accuracy they must be classified under a series of group headings according to (*a*) average mileage per annum per vehicle, or (*b*) average speed per hour per vehicle, and I append hereunder charts showing how these variable factors affect the average working cost per mile.

### Charts 1, 2, 3, 4, 5 and 6.

Chart 1 shows the effect which speed has upon the variable expenses in relation to cost per mile.

Chart 2 shows the effect which mileage per annum has upon the variable expenses in relation to cost per mile.

These curves are based upon standard hours of 4,000 omnibus hours per annum. Therefore, the cost per mile at an average speed of 10 miles per hour on Chart 1 co-relates with the cost per mile at 40,000 miles per annum on Chart 2.

I have made a series of tests during average working hours of the speed per hour for each half-mile section of the route on urban, sub-urban and rural districts, and the results are shown on Charts :—

Chart 3 shows the speed on a town omnibus service in a densely populated area.

Chart 4 shows the speed on an omnibus service in a suburban area.

Chart 5 shows the speed on a long-distance route partly over rural area, Halifax to Manchester.

Chart 6 shows the speed on a tramway equipped with fast travelling cars for urban and suburban areas, and covers the same route up to Hebden Bridge as Chart 4 for the omnibus.

### Depreciation of Motor Omnibuses and Repairs and Maintenance.

68. Another important point to be considered in order to obtain a basis of comparison between one operator and another is the question of depreciation and repairs and maintenance. Some standard ruling should be given on this question, which all operators should be under an obligation to follow.

New omnibuses not only attract more passengers than old ones, but the yearly repair bill is less, hence receipts per mile go up and expenses go down for a time. It would, therefore, be more sound and produce a fairer comparison to load the early years with a higher depreciation charge, so as to ease the position when repair bills begin to increase.

Assume for example a combined cost of £600 per annum for depreciation and repairs and maintenence, and the cost of an omnibus at £1,400. I would suggest 30 per cent. depreciation first year, 25 per cent. second year, 20 per cent. third year, 15 per cent. fourth year, and 10 per cent. fifth year on original cost. This would provide an increasing amount for repairs without disturbing the cost relations.

| Cost of Vehicle £ 1,400 | 1st Year £ | 2nd Year £ | 3rd Year £ | 4th Year £ | 5th Year £ | Total £ |
|---|---|---|---|---|---|---|
| Depreciation .. .. | 420 | 350 | 280 | 210 | 140 | 1,400 |
| Repairs and Maintenance | 180 | 250 | 320 | 390 | 460 | 1,600 |
| | 600 | 600 | 600 | 600 | 600 | 3,000 |

Unless some compensating basis is adopted, a manager operating old omnibuses is placed at a great disadvantage in his cost returns compared with a manager operating a new fleet, although they may be equally efficient in the running of their respective undertakings.

Another advantage which would accrue from this method of accounting would arise from the fact that if at the end of the fourth year expensive repairs were necessary, the vehicle could be scrapped without having to write off a large amount of unextinguished debt. Chart 7 (page 208) explains graphically this point.

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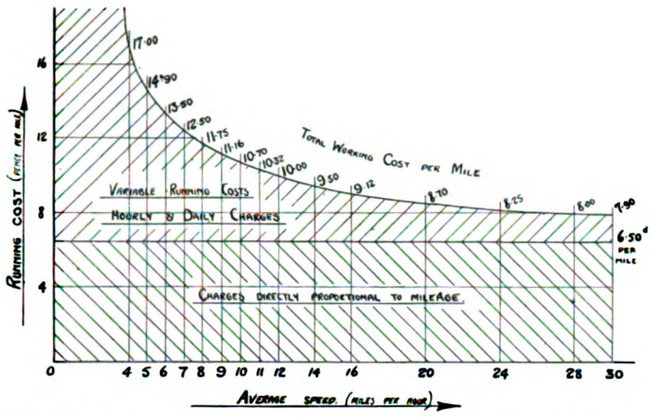


Chart 1.—Showing the effect which speed has upon variable expenses in relation to cost per mile.

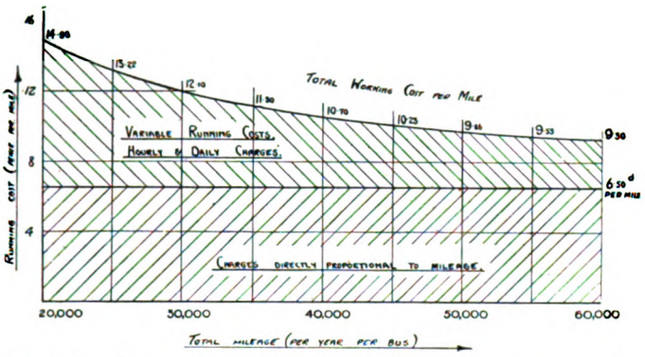


Chart 2.—Showing the effect which mileage per annum has upon the Variable Expenses in relation to cost per mile.

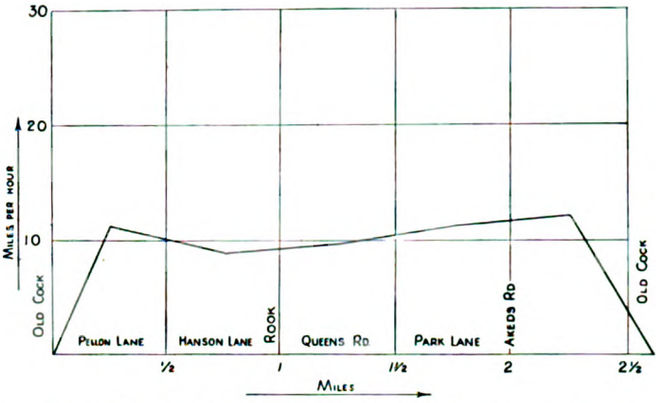


Chart 3.—Speed study of a Town 'Bus Service in a densely populated area. "A" Services.

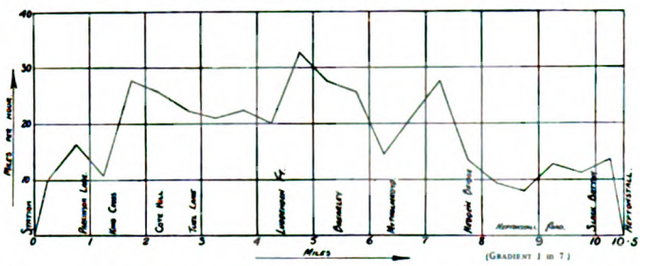


Chart 4.—Speed study of a Suburban 'Bus Service, and negotiating a very stiff gradient, Hebden Bridge to Heptonstall. "B" Services.

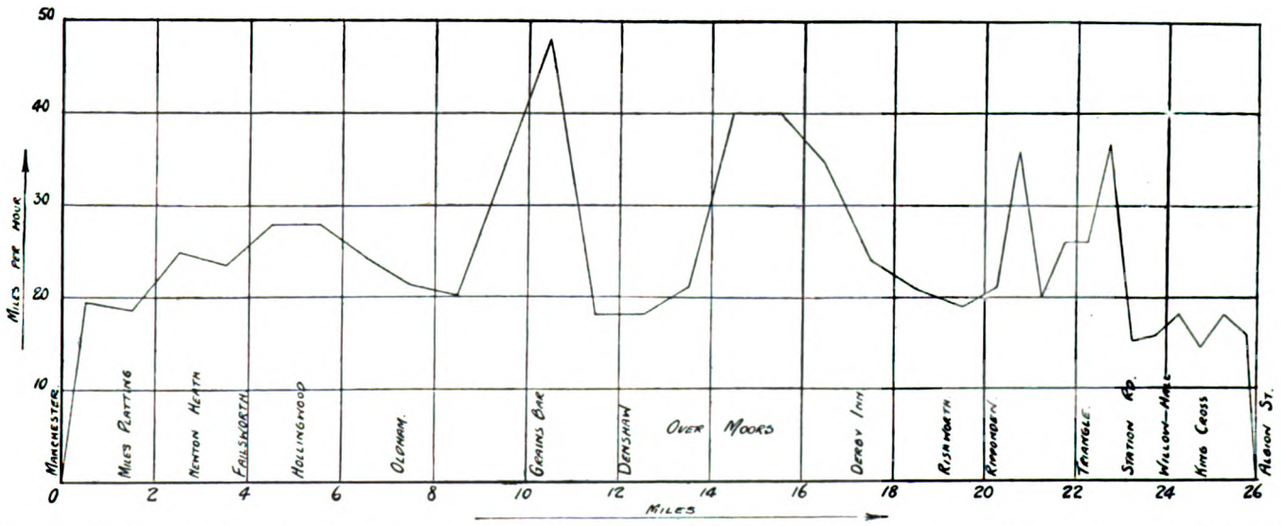


Chart 5—Speed study on Long Distance Route, Halifax to Manchester, partly Congested, partly Rural. "C" Services.

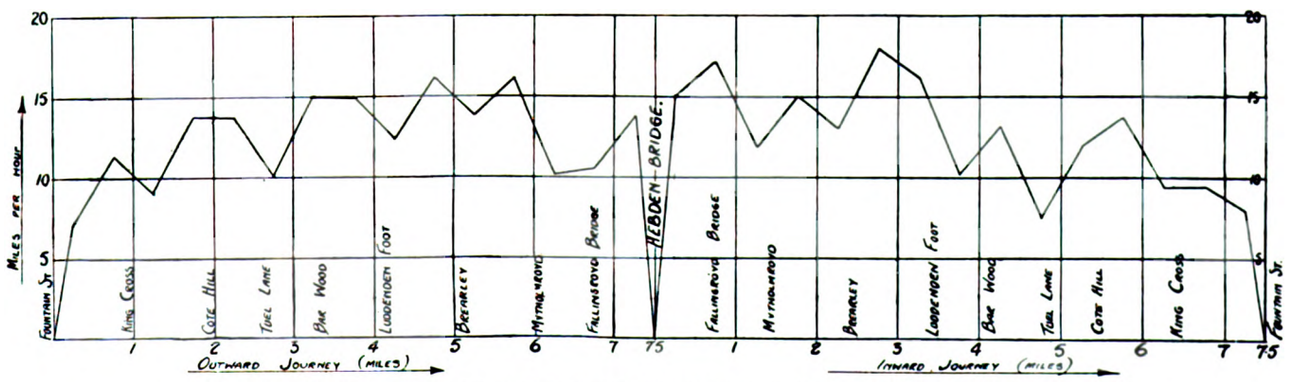


Chart 6.—Speed study on a Tramway Route, by Latest High Speed Tramcar.

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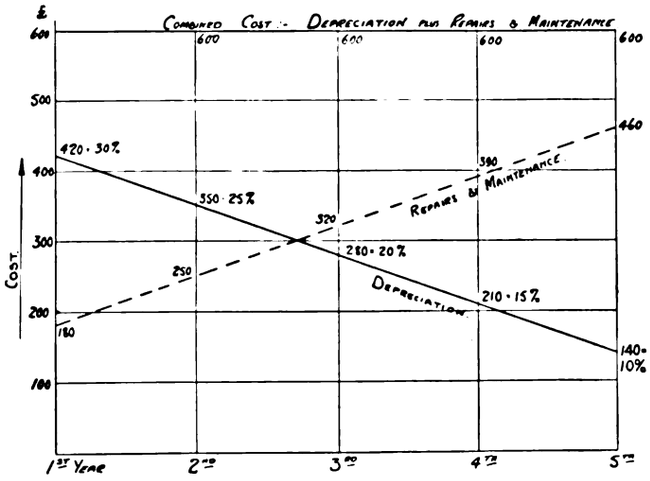


Chart 7.

NOTE.—These figures do not relate to any particular undertaking, but have been assumed for the purpose of illustration.

### TYRE COSTS.

69. Another important point is the question of tyres. Some operators place the whole cost of the omnibus (including tyres) to capital, so that for the first six months they have very little mileage charge in their cost returns for tyres, and consequently in the first year's returns the tyre cost per mile is shown much lower than is actually the case, and the repayment of the portion of the omnibus represented by tyres would be spread over five years instead of being brought into the first year's costs. The life of the tyre would undoubtedly have expired by the end of the first year.

When omnibuses are purchased complete with tyres, the portion of the cost represented by tyres should be immediately charged to revenue account and only the balance placed to capital. The most scientific way of tyre costing is, to purchase the tyres on a mileage basis, to buy the omnibuses minus tyres, and to have the tyres supplied to the omnibus manufacturers by the firm who are contracting for the mileage tyre supply. This system is becoming more general, but if statistics are to be of any value from a comparative point of view, it should be universal.

70. All published statistics of omnibus operations are misleading, for the reason that they take no account of the different methods of purchasing omnibuses—some purchase out of revenue entirely, some entirely out of borrowed money, and others divide the cost between the two.

### OMNIBUS MILEAGE AND SPEED PER HOUR.

71. The method of arriving at the average omnibus mileage per day and the average speed per hour calls for revision as the present statistics are not comparable. In many cases the method appears to be to divide the total mileage by 365 days and then to divide this by an empirical number of omnibuses in daily use, to arrive at the average mileage per omnibus per day. It may be a fact that the earth takes 365 days to revolve around the sun but this has no arithmetical relationship to omnibus mileage for the following reasons :—

(1) Sundays, in many cases, constitute half a day, therefore we must deduct 26 days.
(2) The omnibus has to be overhauled weekly and is usually out of commission for one day per week, hence another 52 days must be deducted.
(3) The annual overhaul and painting will occupy, say, 14 days.
(4) Extra inspection, monthly or quarterly, will involve several more days off duty.

When these deductions are made, it will be found that the maximum days in service will be from 260 to 280, and this should be the divisor to arrive at the actual miles per day which each omnibus runs when in commission.

There appears to be a wide difference in estimating the total number of omnibuses in use compared with the total number of omnibuses in stock. In a few of the statistics which have been examined this variation is as wide as from 50 per cent. to 22½ per cent. There is also no guarantee that the omnibuses which are counted in daily use do, in fact, run the full hours of daily service. Therefore, there can be a wide variation in running hours per day, even with the same number of omnibuses in daily use. It is quite evident from the figures which are produced in the statistics of various authorities that this is so.

I would suggest that *omnibus hours* actually run (not estimated) should form the basis of calculation, then the statistics would be absolutely comparable. The statistics should show :—

(*a*) Total mileage run per annum.
(*b*) Total omnibus hours per annum, from which we should obtain
(*c*) Average speed per hour.

With this information and reference to a standard curve as shown in Charts 1 and 2, we should be able to gauge the efficiency of the year's working with a certainty and precision which is not possible with the statistics as published to-day.

### STANDARD COSTS.

72. When considering the question of accounting statistics and bases for comparison, due regard should be given to the principle of standard costs.

I do not desire to imply an authoritative conclusion on this subject at this stage, but consider the value of comparison between one undertaking and another of paramount importance from a managerial point of view.

Standard costs have weaknesses, obvious and otherwise (no accounting scheme or statistical record can be entirely free from weakness), but as a measure of efficiency, current and cumulative, a good case can be submitted for standard costs of transport services.

Standard mileage can be defined as actual mileage run multiplied by a co-efficient.

This subject is of such importance that I consider it worthy of very special consideration, and I therefore purpose submitting a full treatise on this aspect of the managerial side, namely, standard mileage and standard costs, at a later date.

### MUNICIPAL OMNIBUS STATIONS.

73. Looking into the future one may visualise a chain of municipal omnibus stations in all the cities and large towns. The need for such stations is already present and will continue to make itself manifest as motor omnibus traffic increases. It is inconceivable that the travelling public will be content to wait in the open streets, subject to all kinds of weather conditions, and it is surprising that they have so quietly accepted these conditions up to the present.

The problem of finding locations for omnibus stopping places in busy streets is a very difficult one, and when positions have been chosen adjacent shopkeepers frequently protest against the noise, dirt, and odour from exhaust gases. The oil deposited on the streets constitutes a disfigurement and is often carried on to the floor coverings of adjacent shops.

A municipal omnibus station could be made a paying proposition and would be a great convenience to the travelling public. It could be equipped with a café where passengers could obtain light refreshments whilst waiting for their omnibuses, first-class lavatories and hair-dressing saloons, newspaper and bookstall, a large parcels office to which parcels could be sent by the shopkeepers, a complete guide and map showing all services operating from that centre.

Most towns have a slum area near the shopping centres, and the clearance of such a slum area and the substitution of a modern up-to-date omnibus station would add tremendously to the amenities of the town. The income towards the cost would be derived from a yearly charge upon the omnibuses using the station and the rents from the café, etc.

### GENERAL CONCLUSIONS.

74. When the Road Traffic Act comes into effective operation, an event which will take place during the next few months, a new era in the history of road transport will have commenced, and the development which will take place, both through the passing of this Act and the granting of road powers to the railway companies by their Road Acts of 1928, will be of vital concern to municipal operators, particularly tramways operators.

The Minister of Transport declared when the Road Traffic Bill was before the Standing Committee that his own view was "that these long-distance road transport services will have to be organised upon a national basis, and I think it is inevitable that they will, in due time, be run more and more in association with railway undertakings, who will co-operate with the long-distance road services. I think that that is all to the good, in order to eliminate needless competition between the two, and give additional facilities for the public."

75. It is no use attempting to fight the motor omnibus competition (equipped with new and comfortable vehicles) with tramcars which have done 20 or more years' service and which are slow and uncomfortable, and have not been kept up to date. If the tramway is to remain in favour with the public, it will be necessary to equip the undertaking with new and fast travelling tramcars complete with comfortable seating accommodation, and there is

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still a future for them when so equipped. If fast running cars are adopted, they must be adopted to the extent of thoroughly equipping certain routes, otherwise the advantage of the fast cars is lost through the slow travelling of older cars on the same route. As an example, we have recently in Halifax completely equipped one of our longest routes with fast cars, and have effected a saving in time of at least 33⅓ per cent., and this has regained to the cars a large number of passengers who had left them in favour of omnibuses.

76. A very big problem arises in a tramways undertaking when the time arrives for re-laying the track. It was the custom in many towns and cities at the inception of tramways to borrow on a long term of repayment, and this, coupled with the relatively low cost of installing tramway track pre-war compared with to-day, involved a comparatively low charge upon the industry for interest and sinking fund. We are faced to-day, however, with the position that the term of borrowing has been very considerably reduced and the cost of re-laying the track is more than double, so that the interest and sinking fund charge on new track will be three to four times as much as the present charge for the old track, and on this account it is very necessary to give careful consideration before deciding to relay tramway track. It is well to remember, however, that whilst a tramcar may be counted upon for a satisfactory life of at least 15 years, a motor omnibus cannot be safely relied upon for a life of longer than five years, so that if a long view is taken of the cost of running as between tramcar and motor omnibus, and estimated over a period of 15 years, the capital cost of the frequent renewal of omnibuses should be set off in the estimates against the estimated cost of new track. This cost of replacement of omnibuses over a period of 15 years approaches to, and passes beyond the cost of new tram track, as the density of cars (in stock) per mile of single track increases, as is illustrated in

CHART 8.

77. The density of cars per mile of single track varies largely as the following examples illustrate :—

| Town or City. | Cars per mile of single track. | Town or City. | Cars per mile of single track. |
|---|---|---|---|
| Liverpool .. .. | 4·71 | Aberdeen .. .. | 3·45 |
| Manchester .. .. | 4·31 | Newcastle-on-Tyne .. | 3·28 |
| Sheffield .. .. | 4·24 | Portsmouth .. .. | 3·27 |
| Edinburgh .. .. | 4·24 | Salford .. .. | 3·01 |
| Glasgow .. .. | 4·20 | Bradford .. .. | 2·29 |
| Blackpool .. .. | 4·00 | Huddersfield .. .. | 2·16 |
| Cardiff .. .. | 4·00 | Rochdale .. .. | 1·95 |
| Leeds .. .. .. | 3·65 | Halifax .. .. | 1·77 |

It will be generally agreed that those towns with a congested population and where a tramways undertaking is equipped with double lines of track and fast running modern cars, the undertaking will be able to hold its own for some years to come against any other form of transport.

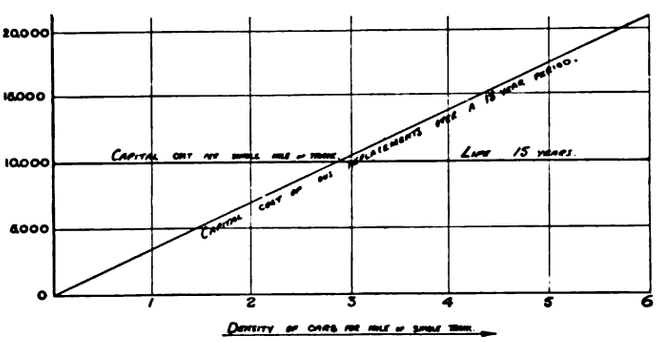


Chart 8—Indicating the Capital Cost of 'Bus Replacements as compared with Tramway Track.

78. During the last few years there have been great improvements in the design and equipment of the trolley-vehicle. It has been modernised to a lower loading platform in the same way that motor omnibuses have been modernised during the last few years, and the equipping of these vehicles with pneumatic tyres and other refinements has made them a powerful competitor, both against the tramcar and the motor omnibus. One important point which must not be lost sight of by a municipality is that the trolley vehicle consumes electricity generated by the Municipal power station, whereas the motor omnibus consumes imported spirit. It would be a very serious matter for the municipal electrical undertakings of this country if they lost the tramway load. It would mean that for some years to come the industries in those areas would have to pay more for their power, which would be detrimental to trade, and on these grounds alone it is necessary to give very careful thought before scrapping a system of transport which is so closely allied with the general interest of the ratepayers.

79. A new competitor is now developing in the form of the heavy oil engined motor omnibus, which is showing promise of gaining considerable ground during the next few years. This subject will be dealt with in another paper.

80. From these considerations it will be seen that those members of the community who are responsible for directing and controlling the policy of the municipal undertakings, are beset to-day by much bigger problems than the industry has had to face in the past, and I hope that in the ensuing discussion the constructive ideas of the members will be pooled for the general benefit and future welfare of the municipal transport undertakings.

## THE DISCUSSION.

**Mr. R. Stuart Pilcher** (General Manager, Manchester Corporation Transport) : I should like, in the first place, to congratulate the author on his paper. He has been, I am sure, to a very considerable amount of trouble in preparing it, and not only is it valuable from the historical point of view, but it will be a book of reference for the future. I want to refer very briefly to one or two points. The first is where the author deals with the different speeds of omnibuses and the relation of speed to costs. In Manchester we have three different types of omnibuses, running at three different speeds. One is the local service, which runs in some cases at an average speed of as low as 6 miles per hour ; then we have the larger city service, which runs at nearly 10 miles per hour ; and then there is the express service, which runs at 13 miles per hour. The effect of this is that the wages of drivers and conductors for the 6 miles per hour service work out at 5d. per mile, for the 10 miles per hour service they work out at 3d. per mile, and for the 13 miles per hour service they work out at 2¼d. per mile. I quite agree with the author, of course, when he says that such figures are very misleading, and it is for us to see if we can find a basis whereby we can get more suitable costs by which to compare town with town.

Another point I want to refer to is that of omnibus stations. In Manchester, as in other cities, we are considering this question, and have decided to purchase a site in the centre of the city on which to erect an omnibus station. I think that all municipalities of any size will be faced with the same problem, not only from the point of view of congestion, but also from the point of view of the general convenience of the public. In Manchester at present we are using a neighbouring omnibus station, and pay from £400 to £500 a year as charges for running into it, but this amount of money will largely meet the interest and sinking fund charges of the new station.

A further point I wish to raise is with regard to Diesel engines. I do not wish to trespass upon the discussion on Mr. Vane Morland's paper, to be presented tomorrow, but I should like to refer to the matter from the point of view of development, because I think this shows a greater stage of development than anything else. I had the pleasure of riding yesterday, in Manchester, on the omnibus which is on view at the conference, and it was running on an ordinary scheduled route. It rode as well as any other omnibus, it was silent and comfortable, and the speed attained was quite sufficient for a city service, and when you consider that that omnibus was running at 2d. per mile less in fuel costs than the petrol omnibuses, it is rather startling. The Diesel engine, of course, is not a new engine ; it is fully developed and is not in any sense an experiment, so I think we can say that in the future, with all the manufacturers making these engines, there will be some rapid developments in their use.

That brings me to a point on which I rather differ from the author, where he speaks so strongly in favour of the retention of tramways. Of course, this is an old subject, and I think we have had it discussed at these conferences for ten or twelve years. Almost any paper brought forward has resulted in a tramways *versus* omnibus controversy, until most of us have come to the stage at which we realise that if the continued operation of a tramway depended upon re-laying the track, in suburban areas at any rate, it would mean the abandonment of the tramways. In my own mind I have come to the conclusion that where suburban lines are to be dealt with in this way, it definitely means abandonment of the tramways. We have had a striking example in Manchester during the last six months, for we have converted a route—I have mentioned it before at a Managers' meeting—and omnibuses are now working there in place of the tramcars, on the same conditions and at the same fares. I want to emphasise this point, because we are apt to say that the tramway has to provide workmen's fares, but I think that an omnibus service, with vehicles to seat 50 passengers, can take over all the obligations of the

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tramway in certain circumstances and can be run on a more remunerative basis. In this particular case we have carried, in five months, 900,000 more passengers, our receipts per mile have increased by a halfpenny, and the total revenue is £7,000 more in that five months. It is difficult, in face of figures such as these, to argue about the comfort of the tramcar and all the other advantages which we know the tramcar has. If the people, in spite of these advantages, will not ride in the tramcar, what is the use of it? We have a route in Manchester, the Altrincham route, on which we have the latest tramcars, with upholstered seating and the best illumination, and running at a maximum speed of 30 miles per hour, for a fare of a halfpenny per mile—4d. for 8 miles—and alongside there are express omnibuses running, at fares which are 50 per cent. higher; yet the people are leaving the tramway to go on to the omnibuses. That is a very serious position to be faced in the future so far as this question is concerned.

**Mr. R. H. Wilkinson** (General Manager and Engineer, Bradford Corporation Transport): We can discuss this paper for a considerable time, but I will confine my remarks to some of the most important points that have occurred to me. In the first place, there is the question of the very heavy depreciation on omnibuses in the early years of their service. That is all right if you are setting out with a number of new vehicles and are content, during the life of those vehicles, to get no new ones. We started off on that basis, but we soon got tired of making these calculations, because we were compelled to order new omnibuses at different periods during the five years life of the original omnibuses, and in that way the depreciation averaged out equally over the period, i.e., we depreciated an equal amount each year. The author speaks of variable expenses, such as tyres, petrol, oil, repairs and maintenance. I take it that what is meant there is that if the mileage of the vehicle is doubled, the expenses on tyres, petrol, etc., are also doubled, but I am inclined to think that if you double the mileage you more than double the cost of these particular items—considerably more than double them. They do not vary *pro rata* with the increase of mileage.

Referring to Chart No. 8, I think that is a very important chart and is very vital to the whole position, but, at the same time, it seems to me likely to mislead people with regard to the values of the different types of vehicle in use. In the first place, it indicates that the capital cost per mile of single track is £10,000. Earlier in the paper the author states that the cost of track construction to-day is three or four times greater than the pre-war cost. Assuming this statement is true, if we divide the £10,000 by three, it will show that the cost of track construction pre-war would be a little over £3,000 per mile, which to my mind is an absurdly low figure. I think £10,000 is much too low, and that the present-day figure should be nearer £15,000, in which case the impression which this chart conveys would be altered considerably. Furthermore, why not add to the cost of the track the cost of the tramcars, which have to be replaced in fifteen years. The author is comparing the cost of omnibuses which have to be replaced every five years, and therefore, why not have regard to the cost of the tramcars, in addition to the cost of the track.

**The Author:** I also take one omnibus against one tramcar, and if we take into consideration the vehicles, it means that two extra omnibuses have to be put on, at the end of the fifth and the tenth year respectively.

**Mr. Wilkinson:** I quite understand that there are three single-deck omnibuses, but when I add on the cost of the tramcars, in addition to the cost of the track, I find that the tramway cost does not come below the omnibus cost in any position on this chart. Furthermore, look at the density of cars per mile of single track. The chart shows from one to six, and one car per mile of single track at an average speed of 12 miles per hour, which is a fairly reasonable average, gives a five-minutes service; therefore, six cars per mile of single track, at the same speed, gives something less than a one-minute service. With three cars per mile there is a one and two-third minutes service, and according to the chart, even as it stands, omnibuses are the cheapest in regard to capital costs on all services with a greater interval between cars than one and two-third minutes. I have gone so far as to add to this chart a line showing the capital costs of railless vehicles; it is considerably below the line relating to omnibus costs, and it cuts through the tramway line half-way between 4 and 5. These are the actual figures that we pay for railless vehicles. I cannot see anything in this chart at all to indicate that the tramway can hold its own. Indeed, I am quite convinced in my own mind that the tramway is doomed, and I will go so far as to say that in ten years time there will be hardly a tramcar in England. Anyway, I will go so far as to say that.

**Councillor J. H. Whitaker** (Chairman, Todmorden Omnibus Committee): I would like to congratulate the author and to thank him for the immense amount of time he must have spent in getting together this information. I do not agree with the conclusions he has drawn from that information, but nevertheless he is deserving of our sincere thanks for the effort he has made. I remember that two years ago, at Manchester, I had a very cold reception indeed; I have never had the "frozen mitt" shown in such a pronounced manner as on that occasion, and it was because I had the temerity to say that the motor omnibus was 50 per cent. faster than any tramcar on the double track and 100 per cent. faster than a tramcar on a single track. I said, further, that the omnibus did not make 5 per cent. of the noise of the tramcar, that omnibuses were more comfortable to ride in and that they did not cause anything like so much congestion, because they could pull in to the kerb to take up and set down passengers. However, all that was received very coldly, indeed. I am not a biassed critic of the tramcar at all. We have none at Todmorden, I admit, but it is to the credit of my predecessors at Todmorden that they considered tramcars twenty years ago and turned them down then. In my opinion they were men of vision, and we have carried on that tradition. I want to say this afternoon that, although we are a small authority, we run omnibuses successfully. We have not a penny of debt on the undertaking, and we have developed the undertaking out of profits, keeping down interest and sinking fund charges by that method. We have not an omnibus which is five years old. The last speaker has told us what he thinks about tramcars, and I may tell you this, as a secret: four years ago I heard from a prominent tramways manager in this country, privately, that the future of tramways will be measured in omnibuses. Of course, that gentleman would not tell you that here at present, but he will do so in another three or four years. Three or four weeks ago I had the pleasure of riding in an omnibus from Hampton Court to Piccadilly Circus. We did that journey in three-quarters of an hour, through a congested area—and you know what the road is like from Hammersmith Broadway. I noted carefully the traffic congestion in London, and I say without fear of contradiction that the greatest congestion which I saw, at all events, was in the north of London, and it was caused by reason of the fact that the omnibuses could not get past the tramcars. It was due to the obstruction caused by the tramcars. The tramcars were picking up and setting down passengers, and the omnibuses were held up because of that.

I have seen tramway tracks in this country which have cost £70,000 to lay in the last few years, but the same service could have been given by omnibuses at a cost of £20,000. I do not say that the tramway authorities should scrap the whole of their tramways, but I do say, as Mr. Pilcher has mentioned, that when a track has become worn out and requires replacement, it is time to consider whether it is economically justifiable to abandon the tramway service and substitute an omnibus service. We must take that matter into consideration if we are not going to discredit municipal control and make ourselves a laughing stock. We can do these jobs as well as private enterprise, but we must apply the same energy and adopt the same methods as our private competitors. I was very interested in one of the charts in the paper, because it is concerned with our district. The author indicates clearly that omnibuses on a certain route attained a speed of 32 to 34 miles per hour. He also states that on a certain route in his town they have re-arranged the tramway service and have put on faster cars, and he asserts that he is winning over adherents from the omnibuses to the tramcars. I want to say, however, that I have seen people leave the tramcars on that very route, in order to get on to the omnibuses. He says he has increased the speed of the cars on that route by one-third, and he told us, when presenting the paper, that he has reduced the number of tramcars there by one. I do not know how many cars he has on that route, but if the speed is increased by one-third, I should expect that the number of vehicles would be reduced by one-third. I think that follows. (Voices:—"No.") Well, we have had that experience; let me put it like that. As to the basis of comparing costs, as set out in the paper, in a town like Todmorden, where we are replacing omnibuses every year, what is the use of a lot of fancy book-keeping? You may laugh, but you can have cranks in regard to statistics and you can continue to get figures out long after they have ceased to serve any useful purpose whatever. After all, a profit is only the difference between the cost of an article and the price the public pays, and I know many men who are carrying on successful businesses without complicated systems of book-keeping.

With regard to the proposed omnibus stations, there is something to be said for the provision of them in large cities, but in small places I believe that if we asked the public to go to a central omnibus station we should lose revenue. Personally, I do not believe that many people would take long-distance omnibus journeys if the railways were handled efficiently by those responsible for them. The railways, in my opinion, could be made to provide the cheapest

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and most comfortable long-distance transport to-day, and I regard the long-distance road transport as a real menace to local traffic if you desire to provide an efficient, frequent and cheap service for the people in your own areas. It is a most serious thing that struggling areas such as my own should have to provide for the requirements of a few people who wish to take long journeys. In my opinion we should provide for the majority of the people in the area, who wished to travel only short distances, and lay ourselves out to give an efficient local service rather than concern ourselves with long-distance traffic. When the needs of the many clash with the needs of the few, the needs of the many must prevail, and I think that is a fair attitude to take up towards this problem. In 1923 we were at Portsmouth, and there a gentleman who has now passed away—a very nice man, indeed, Mr. Alfred Baker, of Birmingham—read a paper on trolleybuses, tramcars and omnibuses. That was the second conference I had attended, and I had the audacity at that time to suggest that we were seriously underestimating the possibilities of the motor omnibus as a serious competitor to the tramcar. In 1928, outside the Adelphi Hotel in Liverpool—and this is germane to the discussion this afternoon—the Chairman of a tramway authority in the north of England and two or three managers were discussing the merits and demerits of tramcars and omnibuses, and the Chairman of the tramway authority said that in two years time there would not be any omnibuses on the roads because the tramcars would have run them off. There is nobody so blind as the man who will not see, and, whether we realise it or not, the future life of tramways is exceedingly limited. I do not say that you can afford to scrap all your tramways; you cannot scrap them in many cases, and you must use them as far as you can.

**The President :** We are not discussing the merits of tramways and omnibuses.

**Councillor Whitaker :** I bow to your ruling, but the point was raised by Mr. Pilcher and was also dealt with by Mr. Wilkinson. All I wish to say is that the future does not lie with the tramway, and that the manager who said that the future of tramways would be measured in omnibuses was right. The sooner we wake up to that fact, I think the more creditable it will be for local authorities generally.

**Mr. J. M. Calder** (General Manager, Reading Corporation Tramways) : With regard to omnibus stations, I do not agree with the establishment of a central station for a city service. Mr. Pilcher has suggested that he is going to build a large omnibus station to accommodate omnibuses, but I take it that he means that it will accommodate only the express service omnibuses which run into Manchester. I say that the omnibuses on an ordinary city service ought to be on the roads taking up their passengers. I have been asked to consider seriously the erection of an omnibus station for our town, and I disagree entirely with the suggestion that there should be a central omnibus station for the passengers using the omnibus services in the city, because it might mean that a passenger would have to walk as far to get to the omnibus station as he would to get home.

**Mr. J. Barnard** (General Manager, Bolton Corporation Tramways) : I had not the slightest intention of taking part in this discussion, but when the President allowed several speakers to bring in a comparison of tramways and omnibuses, and having regard to the fact that two of the speakers came from Lancashire, I thought it must be somebody's duty to say a word on the statements that have been made. Many of you come from the four corners of the British Isles, and perhaps do not understand the circumstances so well as we who are on the spot. I wish to thank the author very heartily for his paper, particularly because he is one of those who has not yet been converted to the view that it is about time we buried our tramways. I have the honour to represent a tramway undertaking operating in a district which I should think is suffering as much as any place in England from the disaster that has struck this country in the matter of unemployment, and furthermore, I can say this, that on the first penny stage from the centre of the town I give a bigger ride than does any tramway undertaking operating in this country, with the exception of Liverpool. I am not standing here and saying that I am running a bankrupt concern. We are still solvent and are likely to remain so for a considerable number of years. The statements that drew me were some of those made by Mr. Pilcher, our President-Elect. He gave you an account of how the Manchester Corporation have scrapped a tramway and have substituted omnibuses, and have taken £7,000 more in revenue in a given time. I want to tell you, first of all, that that particular tramway was described by all the papers in Manchester as the notorious route 53, and Mr. Pilcher will correct me if I am wrong when I say that since route 53 was equipped by omnibuses there has not passed a week in which a serious accident has not occurred. Moreover, Mr. Pilcher did not tell you the difference between the conditions under which the tramway system was working on this route and the conditions under which the omnibuses are working to-day. I hope the Chairman of the Manchester Tramways Committee will not take me to task, but I am going to say that the tramcars that were operating on route 53, before the omnibuses were used, were a disgrace to the city of Manchester. They were single-deckers, and perhaps some of my brother managers will know what I mean when I say that they had double open ends. That means that there were about 12 passengers sitting at each of the open ends and there was a little cabin in the middle holding about 20 passengers. Then, in place of those cars, modern double-deck omnibuses, each carrying 51 passengers, were used. Mr. Pilcher also mentioned another route which is going to be discussed before long. I must agree that Mr. Pilcher has shown foresight in regard to the alteration of his routes, and he has anticipated what is going to happen, but he did not tell you that on that particular route they have to re-lay the track, and I believe that if that is done it will cost about £90,000. Moreover, Mr. Pilcher did not say that there is a competitor coming along which will knock the tramway and the express omnibus service into a cocked hat. Altrincham is the bedroom of Manchester, and the railway company is equipping its line between the two places electrically; I do not think it will be worth while putting £90,000 of capital into a new tramway track, neither do I believe that the omnibuses will be so profitable when the railway competition comes along in a few months time.

A great deal has been said about the speed of the tramcar and the speed of the omnibus, but my experience is that if you have a double-deck tramcar and work an omnibus under the same conditions as the tramcar, running it under the same service conditions as to stops, say, 200 yards apart, on a busy route, you will find there is very little difference. A test of this character was carried out under absolutely ideal conditions, the tramcar running on a decent track and the omnibus on a newly-constructed macadam road. The tramcar weighed 14 tons, and I want you to keep that in mind, because the omnibus weighed only 6 tons. The stopping places were so arranged that there should be 10 seconds stop at each place, and the route was just short of three miles. Do you know what the result was at the end of the run? The omnibus beat the tramcar by only 30 seconds, and I say quite candidly that if the omnibus were driven under service conditions in a manner which would be necessary in order to beat the tramcar by this small margin the omnibus would not last the five years which is usually regarded as the life of an omnibus.

With regard to Councillor Whitaker, we do not take him very seriously, especially when he is talking about tramways, because he knows "now't" about them. He says that tramways will be wiped out, but I want to refer him, for some statistics, to places where the managers have taken their courage in both hands and have put absolutely up-to-date equipment on their tramcars. They have speeded them up, cut out stopping places, and have made the tramcars more comfortable, with upholstered seats. I refer to the London County Council, and to the work done by our old friend Mr. Mackinnon in Glasgow, and I ask Councillor Whitaker to study the results in those cities. The London County Council has made a profit this year, against all the obstacles that have been put in its way, and the undertaking was in a better financial position at the end of the last twelve months than it has been in before. I do not suggest that omnibuses have not a useful purpose to serve. We are all convinced that the single line, with turn-outs, is finished. Where a route will not stand up to something under a ten-minute service the tramcar is finished, but where you have double tracks and a good headway, anything from two to ten minutes' service, and where you have tramcars with 50 H.P. motors, seating 76 passengers and attaining the speed that can be attained with them, with eight stops to the mile, such tramcars will hold their own against any omnibuses in town work. Our President-Elect, Mr. Pilcher, has told you that the speed of some of his town omnibuses in Manchester is six miles per hour, but a number of my tramcars run at nine miles per hour.

**Mr. Pilcher :** The six miles per hour I mentioned refers only to certain omnibuses.

**Mr. Barnard :** I maintain that on a busy route in a city the average speed of all omnibuses is no higher than that of tramcars. Outside, in the country, I agree that the petrol omnibus has its place, as it has also on routes where the density of traffic is not such as to justify the laying of a tramway track.

**Mr. A. C. Fenwick** (General Manager Bury Corporation Tramways) : A point that occurs to me is that we are faced to-day in many undertakings with derelict tracks, single tracks with loops, and we have a choice of three alternatives—to reconstruct the tracks, to introduce trolley omnibuses or motor omnibuses. We are speaking in very large figures as regards the cost of reconstruction of track, and I feel that the manager who recommends his

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committee to-day to spend large sums of money on track reconstruction is a very plucky fellow, having regard to the development of other forms of transport. Personally, I think there is only one course to pursue, and that is to abandon the tramway, because, in going over to motor omnibuses, we are committing ourselves for only five years, which is the life of a motor omnibus, whereas if we reconstruct the track, according to the figures in the paper, we are investing our money for a period of fifteen years, and nobody can tell what will happen in transport in that period of time, in view of the development of the heavy oil engine. With regard to omnibus stations, the varying circumstances in the different towns must be taken into consideration. In my own town we bring in every week large numbers of country people, who have to find somewhere in which they can spend half-an-hour or so whilst waiting for an omnibus, and in those circumstances I consider a central omnibus station can be regarded as a very desirable thing.

**Mr. W. R. Elliott** (General Manager, East Ham Corporation Tramways): I do not wish to carry on the discussion on tramways versus omnibuses to any extent, but there is one point I should like to put to the author. He states that the loan period for tramway track has been too long, and subsequent speakers have apparently fallen in with the author's suggestion that, as the life of the track is practically fifteen years, the loan period should be fifteen years. This can be regarded in two ways; either the loan period of thirty years is too long, or it is too short. I believe the London County Council track was put down on the basis of a loan period of forty years, but the whole of the cost of reconstruction or maintenance of the track is charged to revenue, and at the end of the forty years the London County Council will have a track free of debt. In my opinion that is the correct way. I would like now to refer to Chart 8, where a period of fifteen years has been taken, with a density of from 1 to 6 vehicles per mile; but surely that cannot be correct. If you have only one vehicle per mile the period should be twenty years or thereabout, whereas if you have six vehicles per mile, then fifteen years is too long, as the track, I think, would last only ten or twelve years at the outside. Therefore, the line for the tramway on Chart 8 should not be horizontal, but sloping.

Perhaps I might give the Conference an instance, in London, where the competition of omnibuses was met successfully. There is one particular road on which I am operating an inter-running service. Five years ago that road had a tramway which was faced with serious omnibus competition. We were then working with four-wheel cars, twenty-five years old, seating 54 passengers. The omnibus companies put on their latest omnibuses, and 120 omnibuses per hour passed any particular point. That represented a one-minute service in the slack hours of the day, and our revenue went down to 11d. Then the question arose as to whether it was worth while reconstructing the track, because the working expenses at the time were 14d. We decided to reconstruct and we put on new cars, each seating 71 passengers, the cars being fitted with 50 H.P. motors and with nicely upholstered seats. The speed was increased from 8½ to 10 miles per hour, and within twelve months we had increased the revenue from 11d. to 17d., and our working expenses were reduced from 14d. to 11½d. If ever a tramway reconstruction had justified itself and held its own against omnibus competition, that was a case. The scheduled time of the omnibuses and tramcars on this route is practically the same, and, in spite of what Councillor Whitaker has said with regard to the omnibuses and tramcars in London, the scheduled time is usually practically identical, except on the extreme outside of London.

**Mr. J. Beckett** (General Secretary): With regard to what Mr. Elliott has said as to repayment periods, his next-door neighbours, West Ham, have a long period, but in the interregnum they have had to reconstruct the whole thing and put it on the rates. I think that is conclusive evidence that the period referred to by the author is too long. If we had to start again with our tramways we should never start off with a thirty or forty years period.

**Mr. Elliott:** If we did there should be a reserve fund for reconstruction.

**Alderman W. Greenwood** (Chairman, Salford Corporation Tramways Committee): A point that we should not overlook is that tramway track construction in the old days was carried out at a time when the traffic on the roads was very light as compared with what it is to-day, and that much of the trouble with regard to reconstruction is due to the damage done by heavy motor vehicles which have come on to the roads in recent years. This has, of necessity, reduced the life of the tramway track. If we had known thirty years ago what was coming along in the matter of heavy road traffic, we should have gone in for heavier concrete foundations, etc., so that the tracks would have had a much longer life and the tramway undertakings would not be suffering under the disability of the higher track maintenance charges that they are suffering under in this direction to-day.

**Mr. C. Furness** (General Manager, Blackpool Corporation Transport): I think we must regard this paper as a classical paper and one that we shall read several times over. Several of the views put forward by the author I should like to support, and one is with regard to omnibus stations. Blackpool is the Mecca of Lancashire and Yorkshire, and we get from 700 to 1,000 heavy passenger vehicles a day, particularly during the busy season, coming in to Blackpool. The Council, therefore, has provided an omnibus station in the very heart of Blackpool. We bought a very valuable property, costing some £50,000, adjacent to the Talbot Road railway station and we have as many as 800 vehicles coming into that station every day. Of course, we cannot accommodate from 700 to 800 vehicles at one time, but when we have to deal with more vehicles than we can accommodate there, we send some of them on to the Corporation omnibus garages, which, of course, are empty of omnibuses at the time, because the greater proportion of the Corporation omnibuses are then on the roads out on service. We charge one shilling per vehicle for the use of this omnibus station unloading, and one shilling loading, and it has been the means of preventing an enormous amount of congestion in the streets. Since the advent of the high-speed motor vehicle, people are taking long-distance pleasure rides, and it is just as easy for them to take a pleasure ride into an industrial town as it is to a coast resort, and I say that the streets of our cities and towns have not been built for use as parking places or for the loading and unloading of these vehicles. In many towns there are slum quarters adjacent to the centre, and I think it would be a wise plan to clear these slum quarters and provide omnibus stations in their place; in that way the municipalities would be serving a very useful purpose to the community and advancing the interests of the ratepayers at the same time. I would like to utter one word of warning in this respect, however, and that is that you must not expect to make a huge profit from the charges made at such omnibus stations. The charges must be nominal, and you should not charge against the municipal omnibus undertaking or transport undertaking the cost of palatial buildings such as the author has described, including places of refreshment, hair-dressing saloons, etc.

With regard to costing, I think the author has touched on a very important point when he says that the old form of accountancy on the car-mileage basis is somewhat fallacious. As an electrical engineer by training, I apply the electrical formula of costing to transport. There are fixed charges and running charges, and I think it is worth while for the Executive Council to consider and devise a formula which we, as an Association, could agree upon, one which would take account of fixed charges and running charges, because in that way we should be able to arrive at a better comparative basis of cost, as between the various undertakings, than is possible to-day on the car-mile basis.

**Councillor T. Steen** (Deputy Chairman, Bury Tramways Committee): I fully agree with those who have referred to this paper as a classical paper, and I would like to think that every item in it is correct. Such a paper as this could have been written only by a very clever man. I should like the author, however, in his reply, to give a rather fuller explanation of his views with regard to repairs and maintenance. He puts down a £1,400 vehicle as costing £1,000 in repairs and maintenance during the first five years. This seems a very high figure. With regard to the transfer of tramcar drivers to omnibuses, the experience of many municipalities has shown that there should be some special training for these men before they are allowed to take charge of an omnibus. In many cases the instruction they get is very perfunctory, and I have known instances in which omnibuses have been seriously damaged because the men have not had a sufficient period of training under the new conditions. It is found that when the men are given this extra training the maintenance costs of the omnibuses go down considerably. I should like to know on what the author has based his figures for repairs and maintenance.

Another point is the difference in the design and workmanship of omnibuses turned out to-day, as compared with the vehicles manufactured ten years ago. I think the work of the research departments of the motor omnibus manufacturers has brought the vehicles to an extremely high standard of efficiency, and there is little doubt that the running of these omnibuses will be much simpler for the men and that the omnibuses will not get the same amount of knocking about in the future that they have had in the past. Even the metal that is being used is subjected to very searching tests, and I do not think the bearings of the engines will wear out so quickly as they did in the older vehicles. In the same way the differential gear has been improved in design enormously, and I do not think we need fear that back axles will break as frequently as they have done. With drivers gaining in experience, plus improvements in design and manufacture of omnibuses, I think the figure of £1,000 could be modified.

The discussion was adjourned at this point until Thursday.

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The disussion was continued on the Thursday morning.

**Mr. C. Clarke** (General Manager, Birkenhead Corporation Tramways): I should like to offer a few words of praise and appreciation to the author for the very interesting paper he has given us. It is one which many of us will keep on our bookshelves and will find useful for a long time to come. There is one figure, however, which the author has used in his paper to draw one of his main conclusions from, and with which I do not agree, because, in my opinion, if it is allowed to pass at this conference without challenge, it may lead to alarm on the part of some of the new motor omnibus operators. The conclusion is in paragraph 76, where it is stated that "This cost of replacement of omnibuses over a period of fifteen years approaches to, and passes beyond, the cost of new tramway track, as the density of cars (in stock) per mile of single track increases, as is illustrated in Chart 8." This conclusion is based on a five years' life for motor omnibuses, but I am of the opinion that the life of an omnibus turned out to-day by any of the leading builders will be much longer than five years. The Minister of Transport will allow eight years for repayment of debt, and from my experience I think I can safely add to the author's figure at least 50 per cent. in estimating the probable life of the omnibuses which I have been buying for the past two or three years, and which, indeed, I am now buying. Our present omnibuses are fitted with sleeve valves and renewable valve seatings, and the six-cylinder omnibus engine of to-day is a very much better balanced job than the old omnibuses were. It is not subject to the racket of the comparatively crude machines with which we were being supplied from 1922 to 1926, and I think it is on the experience of the machines that we were buying during those years that the author has more or less based his figure of five years. Even so, the machines we bought in 1922, 1923, 1924, 1925 and 1926, were not scrapped because they were worn out, but because of obsolescence. Therefore, even with that experience it is not right, I think, to allow it to go out that the life of an omnibus to-day is only five years. I bought omnibuses in 1919 and ran them for eight years, from 40,000 to 50,000 miles a year, hard, grinding work, and I sold them at the end of that time for £300 each. That does not look as if they were worn out. They were sold because of the advent of the low-loading omnibus and pneumatic tyres. Of course, I am assuming that a man who is running omnibuses is properly maintaining them. If an omnibus is properly maintained, there is no reason at all why, subject to it not going out-of-date through new models coming out to make it so, its life should not be considerably more than eight years. Therefore, I ask the author to add at least 50 per cent. to the life of his omnibuses, and then he will get a very different reading on Chart 8, and the position of the omnibus, as compared with the tramcar, would be very much more favourable to the omnibus than Chart 8 now shows.

**Mr. A. C. Baker** (General Manager, Birmingham Corporation Transport): I agree entirely with the author that there is difficulty in comparing the accounts of the various undertakings, as the system of costing stands at present, and I believe that that difficulty will persist, on any basis. You must, of course, take into consideration the local circumstances. For instance, the author has taken no cognisance of the size of the vehicle at all. It is much more difficult and costly to operate a double-deck vehicle than to operate a single-deck vehicle. I think you must have some basis of seat-mileage, and perhaps Mr. Silvers, who has put that basis forward on several occasions, may have something to say about it. Reference was made yesterday to the difficulty of training tramcar drivers as omnibus drivers, but we in Birmingham have found that the tramcar driver of a certain age makes by far the best motor omnibus driver that we can get. Certainly the ordinary lorry driver requires a great deal of special training before he is of any use as an omnibus driver. Our experience is that the tramcar driver has better road sense and knows the traffic conditions, and we find that by giving the tramcar drivers an intensive training the road sense they have acquired makes them the best men. I am afraid I can hardly agree with Mr. Pilcher. In Birmingham, you know, we have some considerable experience of omnibus operation and we have scrapped several tramcar routes, but it is not the intention in Birmingham to go in for a policy of wholesale scrapping. I think it may be of interest to this meeting to know that when the question of scrapping certain tramways was before the City Council the hope was expressed that we were not starting a wholesale scrapping policy, because in Birmingham there are still many people who prefer the tramcar, and there is a good deal of feeling in that direction.

**Mr. Pilcher:** I did not suggest that Manchester was going in for the wholesale abandonment of tramways at all.

**Alderman W. T. Newling** (Chairman, East Ham Tramways Committee): I should like to say that I admire very greatly the general trend of the paper, but there are one or two points in it upon which I should like to speak. The question of the life of the omnibus, in comparison with that of the tramcar, is one of much importance, but surely the district in which the vehicles are operating has a great deal to do with it. For instance, where you have a large number of stops, as in London, the lifetime of the tramcar against that of the omnibus is in the ratio of something like three or four to one, and that should be taken into consideration. Then there is the question of the clearing stations. It may be, for rural districts and small towns, a very profitable and proper thing to have these stations, but if the idea is that the public shall go to these stations to get on to their omnibuses, and if there is no possibility of their being able to board an omnibus until they get to a station, surely the tramcar has an enormous advantage there. In London we find people taking the first vehicle that comes along; if they have to wait for 30 seconds or a minute they get very impatient. After listening to some of the speakers in the discussion one might go away with the impression that tramways are obsolete and no good at all. One of those speeches came from Councillor Whitaker. We do not object at all to the gentleman from Todmorden coming to this conference and telling us the requirements of the great city of Todmorden, but when he comes here and talks about the requirements of the small township of London we do object. For instance, he mentioned the conditions in some parts of London, but if I were to make a comparison I should make it between such parts as, say, the Mansion House, where there is a chaotic stream of omnibus traffic, and the Embankment. Between 5 and 7 p.m., on the Embankment, I suppose the tramcars shift, with perfect precision, and without any congestion at all, some 20,000 or 30,000 people hourly. On the other hand, at the Mansion House, where the omnibuses are operating, you find the most chaotic conditions, and it is really wonderful how the traffic is controlled there. Surely, therefore, the difference between the tramcar and the omnibus depends on where they are operating, and certainly in some circumstances the tramcar is decidedly better. Of course, the permanent way is also a matter of importance. If you have a broad highway, and up-to-date tramcars, such as we have on many of our inter-running services, those cars are like Pullman cars. As a matter of fact, about three years ago, when some of our new cars were put on the road, a gentleman living outside the district said to me, "I was in one of your 'palais de luxe' tramcars the other day; they are all right, there is no doubt about it." There are enormous advantages in the tramcar on some routes, and to endeavour to give the impression that the tramcar is finished is an absolute error. As a matter of fact, we have had our cars fitted with mirrors at each end, so that the ladies can see themselves, and you get really luxurious riding. However, much depends upon the district in which the cars are running. Obviously, trolleybuses and motor omnibuses are suitable for some districts, but where you have a large volume of traffic and a good broad highway the tramcar can get away from the omnibus every time.

**Councillor Col. H. Dalton Henderson** (Convener, Perth Corporation Tramways Committee): I do not intend to criticise this paper, but I am sure I shall be permitted to offer my hearty congratulations to the author. I read it through several times before coming here, and, after the criticisms that have been made upon it, I intend to read it over again when I get back, and to keep it as a book of reference for the future. For a moment I want to refer to another aspect of the transport question, which you may possibly think, at first, is not relevant to this discussion, but I think it is. Mr. Gledhill, necessarily, as he was dealing with road transport, did not make any reference to air transport, but that is a question we shall have to consider very soon. I think it is desirable that an association of this kind should look ahead and be prepared to consider that question.

**The President:** I quite agree with you.

**Councillor Col. Henderson:** For 30 years I have been very much interested in Army transport. At first, when training at Aldershot for mechanical transport work we had only one or two omnibuses and other vehicles, including a caterpillar, which was an awful beast. At present, however, you see these vehicles hauling heavy guns. In those earlier days some of us said that the internal combustion engine was going to change everything in transport, and that the horse would be superseded. No man is fonder of the horse than I am, and no man is more sorry, from the sentimental point of view, to see the horse disappearing, but I could not agree in those days with the majority of the horse transport officers and men at the training school at Aldershot, who were emphatic that mechanical transport would never supersede the horse. That was only a matter of 20 years ago, but I read in the newspapers yesterday the announcement that, the Regular Army having been completely mechanised, the Territorial Army is to be dealt with in the same way. The Council of the County Territorial Associations, of which I am a member, has been discussing this question for the past two or three years. Therefore, may I suggest that, by analogy,

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it is time for municipal authorities to begin to look ahead and to begin to discuss the question of municipal air transport? We are behind the times in this respect in this country, and we must soon have municipal aerodromes everywhere. A business man who has widespread interests all over the Continent told me the other day that he had been to Brussels, Berlin, Warsaw, Czecho-Slovakia, Constantinople, Italy and back to Paris by air, and that he had done business in a fortnight that he could not have done in three months, without air transport. In America one can go almost anywhere, from place to place, by means of air transport, and find suitable aerodrome accommodation, and although we have not yet a municipal aerodrome at Perth, I think we shall have one before long. I do not know whether or not the problem of air services will be dealt with by the Ministry of Transport, but, even if they are, the town councils will have to provide aerodromes, and there is no reason why the transport managers in the various areas should not be in control, subject to the Government Department, whether it be the Ministry of Transport or the Air Ministry. It may be rash to prophesy, but I shall be surprised if by the end of the next five years we do not find a municipal aerodrome in or near every town, suitably situated in the country.

**Bailie P. J. Dollan** (Convener, Glasgow Transport Committee): The first thing I want to do before criticising the paper is to correct an impression given by one of the leading newspapers regarding the speech of the Minister of Transport last night which, if allowed to pass, may create a misunderstanding in the mind of the public. Mr. Morrison, in speaking about management, said it was the duty of committees to allow managers to manage and that if they failed to manage they should be removed. That point has not been made clear to the public, and as committee members, we must, in fairness to the management, state that we have a duty to make our direction as committees efficient, and until we have done that we are not entitled to blame the managers for any failures on their part. We must first put our own house in order as committees, and I am quite sure that in these conferences in the last three years the outstanding impression must have been that there is more need for revision and reformation on the committee side than there is with regard to the managers themselves. I say that as a lay administrator. The main fault of municipal transport administration in the country to-day is that it is not quick enough to adapt itself to the changes in the ever-increasing needs of the public, and the whole system of management must be speeded up. That is one of my complaints about this paper; that while it is an excellent survey of the existing situation, it does not suggest to us new lines along which the committee management must evolve. I want to repeat something that I said last year, because if a good thing is to be accepted by the country it must be repeated *ad nauseam* before it is adopted in general practice. It is that not only must committee management be reformed, but what was called by the Minister of Transport, the parish pump mind in municipal administration must be removed entirely. May I, therefore, suggest to my Lancashire friends that when they are discussing tramways versus omnibuses they are doing a disservice to municipal administration, and are not taking advantage of the big opportunity they have of forming the largest scale municipal or public corporation for the management of transport that can be conducted in this country. In certain parts of Lancashire, taking Manchester as a centre, the municipalities are doing a disservice to municipal administration by failing to evolve a new system of ownership of transport on the lines of a unified organisation. It is no use speaking of running arrangements in municipal transport; there must be one unified control of transport.

The sooner the small towns around the big cities realise that it is far better to pool their interests in transport instead of having running arrangements, and to have a public Board managing the whole system, the better it will be for the public and for transport in that particular area. If Lancashire could form a joint tuberculosis Board for the administration of tuberculosis in that large area under one control, it can even more effectively have one control and managership in regard to transport. I should like one of the smaller towns, such as Oldham or Bury, to take the initiative and ask that in that locality a conference of municipal representatives should be held for the purpose of setting up some kind of joint Board which would make transport there, not a matter of committee management in many small areas as now, but one large scheme under a single control, which would be an example to the rest of the country as to how municipal administration can be conducted in a much better manner than it is at the present time. Therefore, I repeat what I said last year, that unless you do this yourselves, it will be done for you by the Government. It is going to be done in London. The London municipalities with their small traffic systems are twenty-five years behind the times. They are keeping back progress, and when I hear delegates in this Conference talking about rocking-horse tramcars, I say that if these cars do exist, it is a sign of lack of brains in the management of those systems. There is no excuse to-day for a tramcar to be run in that condition. With unified control and competent managership, it is possible to have tramcars as comfortable as omnibuses, and in a congested area, practically as fast as the omnibus. Let me give you an example. There is no doubt that success in the Glasgow area is due to the fact that we have amalgamated all the systems under one control; it is also largely due to the ability of my predecessor in office and to the skill and foresight of Mr. Mackinnon, our tramway manager. Glasgow has been able with efficient management to compete against the most widespread omnibus competition that ever menaced a municipal undertaking. We have spent practically £1,000,000 on making our tramcar fleet up-to-date, and there is nobody in the district who will not agree that it is not more comfortable, much safer and much more efficient to travel in a modern tramcar in the Glasgow area than it is in a modern omnibus. Moreover, this expenditure has paid for itself in the increased receipts. Last year we increased our revenue by over £100,000, despite the fact that we had to compete with 1,300 private omnibuses and 200 municipal omnibuses that we ourselves have in service. If that can be done in Glasgow, it can be done in Lancashire and in London. If the London municipalities are not going to do it for themselves, Mr. Morrison will do it for them, and in the next session of Parliament I believe there will be a Bill providing for the compulsory amalgamation of the systems in London in the form of one central control on the lines that exist in Vienna and Berlin and to a modified extent in Glasgow.

Let me go a little farther, and argue that it is a waste of time in big areas to discuss whether the tramcar or the omnibus is the desirable mode of locomotion. In small areas I think the tramcar must go, but in the large areas the two systems must work side by side. There are a large number of people who prefer to travel by omnibus, but generally speaking anybody who has studied the psychology of transport knows that if you have a modern tramcar and a modern omnibus the average man and woman feels it is the right thing to travel by the tramcar. I believe that in getting into an omnibus they feel more like a person who has gone into a night-club in a dry area and that they are doing something they should not. There is still that psychology in your favour; and if you exploit that psychology and use it I can, for the next ten or fifteen years, see tremendous possibilities for the tramcar, and you can give your public a more efficient system than you are giving at the present time. When I go about the country and see some of the tramcars in towns where the authorities are described as municipal undertakers, I think the description is absolutely correct, because the tramcars are far more like superannuated hearses than modern vehicles, and they should be dealt with from that point of view.

Another point with regard to management is that I visited Liverpool two years ago and discussed matters with transport people there, suggesting to them that their methods of administration might be improved. They told me that they believed these things should be left to the management, i.e., the Committee or the Council. That means that they must have a whole town council of 140 deciding what the fares should be and what the routes should be. Yesterday I happened to pick up the "Liverpool Daily Post" and found that Liverpool now is being compelled to do something in its hour of crisis, and is at last handing over to the manager matters which should have been left to him from the beginning, but which hitherto had been taken out of his hands. We should, however, not wait until an undertaking is in financial danger before we do that. It is when a concern is in a sound condition that we should look to these things. The task of the committee is to lay down the general policy and say to the manager "Get on with the job; we will shape the policy and give you all the support and co-operation we can in carrying out that policy." I venture to suggest that if Liverpool had done that three or four years ago some of the difficulties which they want to remove now would probably never have arisen.

There is another point I wish to make. In dealing with omnibus fares I have found that the best reform ever carried out in our district was to hand the fixing of the fares and the routes over to the manager. Since we started operating omnibuses we have not had a single discussion in the Town Council about fares. The fares are dealt with by the manager, and if at the end of the year he does not produce a financial return showing that he has managed the matter well, then he is held responsible. Mr. Mackinnon, however, knows far more about the right fares to be fixed for omnibuses to get the revenue necessary to meet his operating charges than all the members of his committee put together. If that is a good policy with regard to omnibus fares, it is an equally good policy with regard to tramway fares, because whant happens when these questions are considered by a Town Council is this. One-

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third of the Council goes out every November. The one-third that were elected last November and have three years to serve are tremendously courageous and are prepared to put the transport finance in a sound condition. The members who were elected eighteen months ago are more timid and rather hope that these problems will settle themselves before the time comes round for their re-election. At the same time, they are prepared to do something to put the finances in a sound condition. The one-third of the Council, however, who are going out of office in the next November are not caring much whether tramway finance is in a sound condition, so long as they create an impression on the public that if they are re-elected they can run the tramcars for nothing and give every man on a long-distance journey a bottle of beer. You cannot manage a big business like transport on those lines. Therefore if Councils are afraid of their constituents, instead of having the courage to go before the electors and explain the position to them, then we shall have to alter the whole system of municipal management and endeavour to obtain a much better system.

It seems to me that we have continually to keep this problem of management in mind; and that brings me to my last point on management. I suggest that in addition to amalgamation, those municipal pimples like Todmorden must be flattened out. I do not think they should be entirely obliterated, but they must be steam-rollered. When in a large area there are a number of townships which ought to be amalgamated, it is ridiculous that one or two small transport systems under municipal administration should stand in the way of the development of the whole area. Municipalities must consult together and realise that if they want the country to have efficient transport they must combine the services in their areas and give the public what they want. In the larger cities we find Councils consisting of over one hundred members; such a body is incapable of doing more than laying down a general policy. The only general policy it should lay down is whether an undertaking is to be run by public ownership or private ownership. If they decide on public ownership then hand it over to a committee, which should be as small as possible. Some committees consist of ten members, but a better committee still is the manager, with a very good chairman and a competent vice-chairman. These three men will probably do the work far more efficiently than any larger committee. That committee should be allowed to run the undertaking during the year, reporting to the Council from time to time. I should like to see some attempt made at a future conference to allocate one of our sessions to that particular subject, so that we can pool our ideas and suggestions, in order to secure a more efficient committee administration than we are getting at the present time. I do hope, on the other hand, that people connected with municipal enterprise are not going to run around the country saying that we cannot do the work as efficiently as other people. I have met many transport chiefs of private companies, but I have not yet met any who have more brains than we have on the municipal side. I have also met them on the railway side, and I do not find that railway people are making a great success of road transport. They have undoubtedly thrown away money which, in two or three years, they will wish they had saved. They do not know the omnibus business as well as municipal transport managers. Yesterday, Mr. Barnard referred to the Altrincham route. I am informed fairly authoritatively that the railway companies are going to put a service on that route and run their electric trains at a speed of sixty-five miles an hour. If the railway companies direct their brains and initiative along the lines of developing that kind of traffic, you will have much more formidable competition than you have had before. At the present time we have tramcars capable of running at forty miles an hour, and I think there is no limit to tramcar speed. If the same research had been put into the development of the tramcar as has been applied to the development of the omnibus, you would be able to produce a tramcar to run at sixty miles an hour within a few years. I think that in every transport undertaking there should be a research department with capable people dealing with the problems as they affect the particular locality, and when they have arrived at some solution of them, the results should all be pooled for the benefit of the country as a whole.

One suggestion made in the paper is that municipal omnibus stations with refreshment rooms, dressing rooms, etc., should be erected, but I do not believe it is the duty of transport undertakings in the big cities to provide places of this kind. I believe it is a waste of time to suggest that big municipalities should occupy their energies with running tobacco kiosks and the like. Sheffield has already moved in this direction. They have a big scheme for running such places, but if you are going to eliminate Bill Jones the tobacconist and Mrs. Brown who sells buns, you are overdoing it. We have bigger problems to solve than those small things. In the small towns these stations might be all right, but in big cities we ought to have through-running services. I think that services ending in the city are a waste of time and a cause of congestion. In municipal transport management throughout the country we have highly skilled men, who are being paid salaries 25 per cent. or 50 per cent. less than they would be receiving if they cared to transfer themselves to private enterprise. I say that these men very often are not appreciated as they should be. I know at least half-a-dozen managers of municipal transport undertakings in large cities who, if they cared to go over to private service to-morrow, would undoubtedly have their salaries increased by 50 per cent. It is a great tribute to municipalities that they prefer to remain with them.

I will end as I began by urging the great need for municipalities over large areas to get together and bring the road transport under public control and make municipal enterprise in transport matters what it should be.

**Councillor R. Edwards** (Liverpool Tramway Committee): I hope the conference will pardon the audacity of one who is the youngest delegate here, in making a small contribution to the discussion. Perhaps it is unfortunate that I should follow a practised orator like Bailie Dollan, but I am interested in one or two points that have arisen out of this paper. With regard to municipal omnibus stations, I feel that they are an urgent necessity in all the big industrial centres of this country. Although Bailie Dollan may make a very good case for saying that these omnibus stations have no real value, I think he will agree, as a student of psychology, that there is something in establishing a centre to which the general public can go, knowing that they have there facilities for travelling all over the city. I am impressed with the scheme set out in the paper, because I am a passionate supporter of the extension of municipal services, and I believe there is a good deal of scope for municipalities to cater for private omnibuses at central omnibus stations and obtaining a revenue from them for the use of those stations. I feel that there is one danger, however, and it is that, by making the omnibus stations too elaborate, you will create colossal interest charges which it will be difficult to meet. Liverpool, I think, is a fairly good example. We built there a very large, and possibly the finest transport depot in the country, at a cost of over £500,000, and the interest charges amounted to over £30,000 a year. I should like some information on this subject from the author. I feel that what local authorities need at the present time is cheaper credit, because municipalities cannot stand against private omnibus competition when they are compelled to meet every year such collossal sums in interest charges. I find that in six years Liverpool has paid in interest charges alone a sum of £300,000, and therefore I think some attempt should be made nationally to provide local authorities with cheaper credit. I have heard that in Birmingham, due to the operations of the municipal bank, they have been able to get cheaper credit for the Transport Department. I do not know whether that is true or not. (A voice: It is not.) I have heard it stated that Birmingham has been able to get money half per cent. cheaper in the open market than it otherwise would have done, because of the municipal bank. (A voice: That is not true.)

**Mr. J. Beckett** (General Secretary): Liverpool borrowed last time at 4¾ per cent., whereas the companies have to find 10 per cent.

**Councillor Edwards:** Nevertheless, I think we ought to have facilities for getting better credit. Local authorities can offer the finest security, and in spite of what Mr. Beckett has said, I think some attempt should be made nationally to supply local authorities with cheaper credit than they are getting at the present time. Another aspect of the question on which I should like some more information as a layman is in regard to the contributions from tramway profits to local rates. I feel that if that money were put back into the tramway organisation we should have a far better service than we have at the moment. In Liverpool, in six years, we have made voluntary contributions amounting to £315,000 to local rates; if that had been used for reducing debt and interest charges we should have had probably the finest transport service in the country by now, and possibly the finest in the world.

**Alderman Curwen** (Chairman, Lancaster Tramway Committee), in an amusing speech, urged municipal councils to give their transport managers the fullest possible freedom of action and not to interfere in matters of detailed management.

**Councillor T. Steen** (Deputy Chairman, Bury Tramways Committee): I should like to say, in reference to Mr. Baker's comments upon my previous remarks concerning tramcar drivers, that I was not referring to tramcar drivers specifically, but to inexperienced omnibus drivers generally. I realise that the tramcar driver must necessarily acquire a high degree of road sense, and in Bury we welcome the tramcar driver sincerely as an omnibus driver. I should like to correct the erroneous impression I appear to have

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given, because I should not like it to go out from this conference that I held any such views. What I meant was, that an omnibus driver, like the new owner-driver of a private car, at the beginning of his driving career, punishes an omnibus more than he will when gear-changing, etc., becomes a matter of simplicity to him and therefore, as drivers become more experienced, repair costs will fall.

**Mr. A. C. Baker** (General Manager, Birmingham): I am glad to have that explanation, because I thought you were talking about tramcar drivers as such.

## REPLY OF COUNCILLOR GLEDHILL.

**Councillor Gledhill,** replying to the discussion, said:—I am pleased that the paper has aroused a fair amount of discussion. That was the object of it, of course; I do not believe in writing a paper with which everybody agrees. The object of a paper should be to arouse a discussion, so that from that discussion we can gain further knowledge. I am a little disappointed, however, that the discussion has centred upon the eternal question of tramcar *versus* the omnibus. We might go on discussing that subject for a whole year and still be in the same position. There would be certain members on one side of the camp in favour of tramways and certain members on the other side in favour of omnibuses, and it is a question which each authority must settle for itself. I believe there were, at the time of the inception of tramways, many small authorities who put down tramways but who never ought to have done so, and because it has since been found that in such areas it is better to operate omnibuses and to abandon the tramways, it is not logical to assume that the day of the tramway is over. Such an erroneous conclusion is too often made in the Press. The tramway certainly is not finished for the bigger centres, and it is not finished where the organisation has been modernised and brought up-to-date and given an efficient equipment.

I should like to thank Mr. Pilcher for his very valuable contribution to the discussion, and for the time he has taken in estimating the average speed per mile of local, city and express services. If you refer to Chart 3, where I give the average speed in a town area, you will notice that the average speed shown is 10 miles per hour, but that average speed is a running test, and since that service is doing a 20-minute service and gets round in a quarter of an hour, there is 5 minutes waiting time in the centre of the town, which brings down the average speed somewhere near to what Mr. Pilcher gives as his average speed, and which, I take it, would be the overall average for the day.

The question of omnibus stations has been raised by several speakers. It was never my idea, in suggesting municipal omnibus stations, to infer that the municipalities should run cafés, etc. All I wanted to suggest was that the municipalities should build the accommodation and rent off certain portions for such purposes as a café, hair-dressing saloons, waiting rooms, etc., to private enterprise, the municipalities drawing the rent. I think that is the soundest way of running such stations. The question has been raised as to whether these stations should be provided by the transport committees. I have been in favour of municipal omnibus stations for some years, and if our tramway undertaking were in a more profitable position I should certainly have pressed the tramways committee to have inaugurated such a station. But I feel that this is not a question to be taken up so much by the tramways committee as by the Council itself. It is really a municipal matter, because it is obvious that if such a station were built it would have to be used not only by municipal omnibuses but by the long-distance omnibuses of the private operators as well. You could not have a municipal omnibus centre, as such, and allow the private operators to stand their vehicles at the present stopping centres, because obviously that would be throwing trade into the hands of the private operators. If municipal omnibus stations were started they would have to be centres for all omnibuses to arrive at and depart from, although that would not mean that they should not stop at some of the street stations, as at present. The point is that it would prevent private omnibuses remaining in the streets. The trouble to-day is that, in order to maintain a headway with the omnibuses, you must provide a few minutes waiting at some stopping centre, and three or four minutes wait in a busy street constitutes a very great nuisance from the point of view of traffic, and it leads to complaints about exhaust gases.

Chart 8 was challenged by Mr. Wilkinson, who said that I did not provide for an omnibus in exchange for a tramcar. I thought I made it quite clear in the paper that if you take the life of a tramcar as 15 years, and if you take a density of, say, 2 tramcars per mile, you would require 2 double-deck omnibuses to replace those 2 tramcars. I did not bring into this Chart initially either 2 tramcars or 2 omnibuses; what I did bring into the Chart was the replacement of the original omnibuses in 5 years' time by 2 further omnibuses, and the replacement, in another 5 years, of those 2 further omnibuses. You can make an estimate for 15 years somewhat on these lines; take the case of laying a track and running the number of miles which you estimate would be run by the tramcars on that particular track for 15 years, and multiply that by your average running cost per mile, which includes the repair and maintenance of your track, and add to that 2 new tramcars giving them a life of only 15 years, you get a certain figure. On the other side, you must have 6 omnibuses, i.e., 2 to replace the tramcars initially, and 4 more to replace those 2 at the 5 and 10 years periods. If you take the same mileage run by the omnibuses and multiply that by your running cost for the omnibuses—which again includes repairs and maintenance of the omnibuses—and if you add to that the annual cost to the ratepayers of the upkeep of the road, and multiply that by 15 years, and again, add the loss in rates, you will arrive at another figure on the other side, from which you will be able to get a comparison which will guide you as to whether to continue the tramways or adopt omnibuses. In regard to Chart 8, also, another speaker said that the line for the track at 15 years should not be a straight line, because with a density of 6 cars per mile on the track the rails would wear much more quickly than with a density of 2. I think there he is confusing repairs and maintenance with the initial capital cost. I am dealing simply with capital cost, and not with repairs and maintenance. The figure of £10,000 per mile of single track is one which was given me by our borough engineer as the figure which he puts into estimates for the Ministry of Health when he is asking for borrowing powers. That is the capital cost of the track, and questions such as the density of cars and whether or not the track will last a certain length of time are purely questions of repairs and maintenance and do not affect the capital charge. Similarly, in dealing with the capital cost of omnibuses, I took 2 omnibuses at £1,800 each on a density of 2 cars per mile. That would be 4 omnibuses to renew in 15 years, at a cost of £1,800 each—£7,200. If you take a density of 4 tramcars per mile, it means that you would replace these with 4 omnibuses initially, and that does not come into the Chart at all, because it is a straight cancelling out of the 4 tramcars. In that case you would require 8 additional omnibuses in 15 years = £14,400, which gives the position on line 4 of the Chart for the cost of the omnibuses. I hope I have made that point clear.

To some extent Councillor Whitaker, of Todmorden, has been answered by Bailie Dollan, of Glasgow, whose very instructive speech I listened to with great attention. I am sorry to say, however, that I was hardly able to distinguish what Councillor Whitaker said to-day from what he said last year at Yarmouth, or, indeed, what he has been saying for the last 20 years—because he has been coming to these conferences since 1902. I should like to emphasise again that what is good for a small urban area cannot be taken as a general policy for a large industrial town, and that is the crux of the whole position with regard to Councillor Whitaker's remarks. There is one point which he mentioned, however, on the question of depreciation, namely, that instead of using the figure which I recommend, of a gradually depreciating amount, starting, as shown on Chart 7, at 30 per cent. and going down to 10 per cent., if regular purchases of omnibuses were made over a number of years, the charge should be the same. There, however, he is thinking in terms of an accumulation of the accounts under a classification number, but I am dealing in this paper with individual costs and I am not accumulating these costs into one general classification number. I maintain that only by taking individual costs can we get down to real efficiency. If you do not know the cost of a particular omnibus each year, and know only the total cost of the whole undertaking for the year, and divide that by the mileage, you have no measure of what you need to know, namely, the cost of each omnibus for the 12 months, and if at the end of the fourth year you find a heavy repair necessary for that particular vehicle, it is very much easier to scrap it, if you have written down its capital cost 90 per cent. by the end of the fourth year; by the other method you would sill have 20 per cent. of the capital debt outstanding on that omnibus. Councillor Whitaker referred to a man who kept his accounts on the back of the mill door. We cannot continue our industrial organisation on the old methods of the past, and I hope he does not suggest we should keep the accounts of our transport undertakings in that manner.

I was gratified by Mr. Barnard's contribution and the way in which he dealt with a few of the previous speakers. I was told last night, however, that Mr. Barnard did not give us the real facts

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about his own undertaking, and that the reason he makes a profit on his penny fares is because he charges three-halfpence on Saturdays.

**A Delegate :** That is not so ; he takes the halfpenny off during the week.

**Councillor Gledhill :** I was very much obliged to Mr. Barnard, however, because he answered several speakers and has thus saved me the trouble of doing so. In reply to Mr. Elliott, of East Ham, to him also I wish to make it clear that I am dealing with capital cost only, and that we must not mix the capital cost of the installation of the track with the cost of repairs and renewal of it, because the latter goes down to the revenue account and not the capital account. It is undoubtedly the fact that many of our tramway undertakings to-day are very badly handicapped, because in the past, in their wisdom or otherwise, they did two things ; in the first place, they borrowed money for the provision of the tramway track on much too long a period, so that now, when they have to renew that track after 30 or 40 years, there is still a considerable amount of un-extinguished debt which has to be charged to the revenue account. It cannot be retained in the capital account, and it has to be cancelled out. Secondly, far too much money has been taken from the undertakings for the relief of rates. As chairman of our own committee I went through the accounts, and I found that in the eight years from 1920 to 1928 the Finance Committee of Halifax took £30,000 from the tramways undertaking for the purpose of relieving the rates, and yet in the same eight years when I turned to the renewals account I found that that account, which stood at £74,000 in 1920, had been completely depleted by 1928. If you call that sound finance, I don't, and I went to the Council and told them that, since they had taken this £30,000 out of the undertaking they should pay it back again in the form of a contribution of £10,000 a year for three years. I am pleased to say that we have already got back £20,000, and that we are receiving the other £10,000 next year.

The contention I have made in Charts 1 and 2 was practically supported by Mr. Elliott when he said that in his district, by putting fast-running cars onto the tramways, the expenses have been lowered. Obviously, you must do that, because if you increase the speed per hour you increase the mileage per day and the mileage per annum ; you increase the divisor into your running costs, and therefore you reduce the quotient. I mentioned yesterday, rather erroneously, that we had saved one car on the Hebden Bridge route, but it is really a saving of one car wholly and another car for half a day, so that we have in respect of that route an increase of £3,212 in revenue, and we have also a saving of one car, which costs £1,000 a year in wages and upkeep, and half a car, which costs another £500 in that respect, so that the total of the increased revenue and the savings effected on that route amount on the whole to £4,712 per annum.

I was very pleased that Mr. Furness in his helpful contribution supported the policy of municipal omnibus stations, and whilst there might be some doubt in a city like Glasgow, for example, as to having one central omnibus station, I do not think there is any doubt at all in the smaller towns. It may be necessary in the very large cities to have more than one such station or it may be difficult to have one at all in a few of the very largest cities in this country. That, however, does not alter the general principle and I believe that the question of providing municipal omnibus stations in the majority of our towns is a very urgent one.

The question of repairs and maintenance was mentioned by Councillor Steen, of Bury, and I think he wanted to know whether the figures I have given are authoritative and can be relied upon by other authorities. It is extremely difficult to be authoritative on these matters. I have taken out the cost of repairs and maintenance for several towns from which you must deduct about ½d. per mile for tyres, because most towns include tyres in repairs and maintenance, and the figures I have are : Birmingham, 2·939d. ; Manchester, 2·508d. ; Wolverhampton, 2·243d. ; Edinburgh, 2·138d. ; Cardiff, 1·97d. ; Leicester, 1·92d. ; Halifax, 2·946d. ; Lincoln, 2·08d. ; Oldham, 4·29d. ; St. Helens, 2·049d. There is something wrong in some of these amounts, I think. For instance, I took the St. Helens' accounts and found they give a total overall cost of 9·157d. for their omnibuses, which is several pence lower than any other municipality. I turned then to their tramway accounts and found that they are several pence more, and the obvious conclusions from these figures is that they are charging expenses to the tramways that ought to go to the omnibuses. That again raises the question of the necessity for some accurate method of account keeping to avoid people being misled as is the case at present. Moreover, the present position leads to figures being placed before authorities, who are considering the question of omnibuses, which are not representative of the costs, and I know of many cases where omnibuses are housed in tramway sheds and nothing is charged for rent or for general overhead charges. It is necessary that we should get a standard basis so that the costs which are published are comparative and can be relied upon for guidance. I may say to Councillor Steen that I based my figures on standard omnibus hours of 4,000 per annum, with an average speed of 10 miles an hour, making 40,000 miles a year, which is 200,000 miles for five years, and I estimated the repairs and maintenance at slightly under 2d. per mile, which gave the figure of £1,600 for repairs and maintenance over five years. If the repairs and maintenance are more than 2d. per mile, the total would be more than £1,600, and you would have to adjust the Chart to suit your local conditions.

The life of the omnibus was suggested by Mr. Clark to be more than five years, and there again he was criticising Chart 8, but I will say that if he wants a longer life than five years for the omnibus I want a longer life than 15 years for my tramcars, because any tramcar well maintained can easily have a life of 25 years. Therefore, it does not alter the ratio set out in Chart 8. If Mr. Clark will come to Halifax and give us £300 per omnibus for some old omnibuses, I will sell him 12 to-morrow, and he can make a good commission on them.

A good point was made by Mr. Baker when he referred to the seating capacity of the vehicle, and if you read the paragraphs on standard costs and standard mileage you will see that the co-efficient would take into account the seating capacity. We take very great care in this country in preserving our standards of weights and measures. We have a standard yard or a standard foot and standard weights, but when we come to statistics we have not a foot rule to measure them with, and the whole object of the paper is to bring forward the suggestion that we should endeavour to arrive at some standard method of assessing relative efficiencies by the statistics issued by various undertakings.

**Councillor A. H. Gledhill.**
*Chairman, Halifax Corporation Tramways Committee.*

The matter of Committee management dealt with by Bailie Dollan I feel is outside the scope of this paper, which deals with the transition of transport and not the transition of Committees, therefore I shall not detain you on that point. Bailie Dollan's contribution, however, was very interesting and largely on the lines of the excellent paper he gave us last year at Yarmouth. I quite agree with him that the fixing of fares should be under the control of the manager who knows the conditions. When matters affecting fares come before a Council you have the ward element coming in. If you increase the fares in a certain ward the Councillors in that ward will oppose you whatever the justice of your case may be.

I was asked privately last night by Mr. Chamberlain with regard to our general working agreement with the railway companies, and

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whether we were tied down not to negotiate with any private operator. The agreement sets out that the Corporation shall not, except with the consent of the Joint Committee, alone or in association with any other company, body or person, operate any passenger omnibus service outside the borough. It also ties the railway companies to the same conditions on their side, so that no agreement with any other operator can be effected without the consent of both the corporation and the railway companies.

In conclusion, I thank you very much for the great interest you have shown in the paper and the speakers for the very kind references they have made to it. It is some satisfaction to me for the trouble I have taken to prepare the paper to know that it has been so well received.

**Councillor T. Garnett** (Deputy Chairman, Sheffield Corporation Transport Committee), proposing a vote of thanks to the author said: I think the members of the Association are deeply indebted to Councillor Gledhill for his paper and for the discussion it has promoted. It is perfectly true that many of the features arising out of the paper have been overlooked, in some degree, through the discussion centring largely round the controversy of the tramway *versus* the omnibus, but despite that I am sure the author will be pleased with the fact that so many speakers have discussed the paper and that their criticisms have been directed to helpful channels. I am quite satisfied, moreover, that although there has been this discussion of the paper, the value of the paper has not been exhausted and that during the next few months members of Councils particularly will derive great benefit from it, because there is so much in the paper that can be used for reference later on. I was particularly interested in the aspect of the paper dealing with co-ordination and also with Bailie Dollan's contribution on that point. It is perfectly true that to-day there are many authorities operating transport undertakings who ought to get out of the business altogether. I am satisfied also that whether these authorities desire to co-operate or not, they will be compelled to do so within the next few years, and to merge their interests with those of the larger authorities. I am rather inclined to think, moreover, that whilst the central point of Bailie Dollan's remarks is excellent, he is inclined to under-estimate the importance of some of these smaller authorities. As far as omnibus stations are concerned, we in Sheffield are in hearty agreement with the author's proposals. It is perfectly true that our Bill was thrown out, and Bailie Dollan appeared to criticise us because in the plans for our omnibus station provision was made for refreshment rooms, etc., but we are not keenly concerned whether the Corporation supplies these refreshments or whether this is let out to somebody else. At the same time we feel that we have reached the point when a central omnibus station is essential, realising at the same time that transport to-day is not merely a matter of a few miles. In Sheffield to-day you can see coaches running from Newcastle to London and we are bound to recognise that the passengers will require refreshment at some point. Therefore, we thought it was quite a reasonable thing to make provision for supplying these long-distance passengers with refreshment. The railway companies do it and are not criticised, yet the municipalities are criticised the moment they propose to do the same thing. Moreover, we frequently find at our inquiry offices that people are at a loss to know where they can get an omnibus, and a central omnibus station would solve that problem. In addition, such a central omnibus station would relieve a great deal of congestion in the streets which very often does damage to the business people, in addition to being a danger to life and limb. For these reasons we support very strongly in Sheffield the idea of the central omnibus station. I was particularly interested in the remark of the author as to the ward influence coming into the question of alteration of fares. Quite recently a member of our Council submitted a proposal for an alteration of fares and every alteration proposed affected only the particular ward which the particular member represented. That, of course, is carrying things to the point of ridicule. However, my duty now is to move a hearty vote of thanks to the author for his excellent paper and I do so with the greatest pleasure.

**Councillor Charnley** (Vice-chairman, Blackburn Corporation Tramways Committee): I have great pleasure in seconding the vote of thanks to the author. This is my first Conference and I must say that I have been greatly impressed with the proceedings. In my opinion we have not yet been able to digest the paper fully, and it deserves a great deal more consideration than we have been able to give it this morning. I agree with those who have spoken in favour of central omnibus stations. The difficulty of a Conference like this is that so many conflicting opinions are put forward that one wonders at the end where one stands. It seems to me very difficult for anybody to be emphatic in their opinions on any particular point because of the difference between the circumstances in one district and another, and that applies particularly to this question of omnibus stations. We have not one in Blackburn, but we are giving serious consideration to it. It would not only centralise the travelling public, but I believe it would remove congestion in the streets and mean a great saving to the public in the district. With regard to Bailie Dollan's criticism of Lancashire, I would like to inform this Conference that Lancashire was the first county to attempt a Road Traffic Bill which I think you will find has been of some assistance to the national Government in drafting the Road Traffic Bill, and I have no doubt we in Lancashire will solve our problems in due course.

**Councillor J. D. McClure** (Chairman, Belfast Tramways Committee): It gives me the greatest pleasure to associate myself with this vote of thanks to the author. I do not know whether he is a member of the profession to which I belong—I am a chartered accountant—but whether he is or not I must say that in my opinion no member of that profession could have laid down sounder views on cost accounting or have given us more valuable charts than the author has done.

**Mr. W. Vane Morland, A.M.I.Mech.E., M.I.A.E., M.Inst.T.**
*General Manager and Engineer, Walsall Corporation Transport.*

**The President:** I cannot put this resolution without expressing my personal thanks to the author. Anyone reading the paper must be impressed with the tremendous amount of time and research that has been put into it, and the paper is a document which we shall be able to turn to for a long time and obtain information from. It is one of the best papers I remember being read at our Conferences, and therefore in putting the vote of thanks I wish to express my personal thanks to the author for the service which he has rendered to the Association.

The motion was carried with acclamation.

**The Author:** I can only say once more that I appreciate the very kind way in which you have received the paper. It is a great gratification to me to feel that I have produced something which not only the managers, but also members of Councils will be able to study for some time.

The Congress then adjourned until the afternoon, when Mr. W. Morland read his paper on "Progress made with the development of the Heavy Oil Engine."

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# PROGRESS MADE WITH THE DEVELOPMENT OF THE HEAVY OIL ENGINE

**By W. VANE MORLAND, A.M.I.Mech.E., M.I.A.E., M.Inst.T.**

*General Manager and Engineer, County Borough of Walsall Tramway and Motor Services.*

Ever since man emerged from the most primitive standards of life, his growing intelligence has applied itself to the matter of rapid transport. Yet it is only yesterday, as time goes, that the steam engine and the electric motor were conceived and perfected.

Otto created a sensation in the hitherto unchallenged world of steam power in 1876, by producing the famous Otto silent gas engine. The exact date of the dawn of the petrol age is somewhat obscure. Julius Hock had, in 1870, produced a somewhat cumbrous petroleum engine. In the year 1883 Daimler, making use of the Otto or four stroke cycle of operation, conceived the idea of producing very small engines rotating at high speed. In 1886 he produced a motor bicycle and by 1887 he had succeeded in building a motor car propelled by a petrol engine. Still another new source of mechanical energy had been wrenched from Nature's jealously-guarded storehouse in 1897, when the famous Dr. Diesel produced a successful oil engine of a new type, having an unprecedented economy of fuel and that too of a much cheaper grade than hitherto in common use.

Since its initial development as a motive power for submarines, the Diesel has fought a desperate battle for the supremacy of the seas.* How rapidly this remarkable engine is driving steam from the seven seas may be judged from the shipbuilding returns published by *Lloyds Register* for the quarter ended June 30th, 1930. The tonnage of motor ships now building in Great Britain is 831,159 tons, compared with 556, 804 tons of steamships. Abroad the motor ship tonnage (1,089,346 tons) now building is more than 94 per cent. greater than the tonnage of steamers.

In other fields of engineering the Diesel was long regarded as somewhat of an ugly duckling. A past generation of engineers, bred, born and steeped in the technicalities of steam-created energy, greeted this intruder with ridicule and opposition, mainly compounded of lack of understanding and technical conservatism. Nevertheless, the enormous economic superiority of this remarkable engine, operating in certain circumstances, gradually overwhelmed the opposition, and to-day the Diesel is playing an important and ever-increasing part in the power scheme of the world.

In the earlier history of the Automobile Engineering Industry, the Diesel attracted little notice. Prior to the great war, the manufacturers had achieved a considerable degree of perfection with their petrol engines, and the industry was making steady but sure progress in the development of heavy mechanical road transport.

With the outbreak of the war, the whole of the resources of the automobile industry were concentrated on the production of thousands of vehicles and aircraft urgently required for the various battle fronts. Progress and development, which in the ordinary course of things would have taken many years, was achieved by leaps and bounds, and at the conclusion of hostilities the motor manufacturers, as a result of the enormous experience gained in the various theatres of war, found themselves in possession of a wealth of reliable petrol vehicle data with which to fashion new instruments of transport, and a country, educated by their object lesson of war transportation, eager to purchase their products.

To-day, Britain has definitely outstripped the remainder of the world in the provision of road transport services, whilst her automobile manufacturing industry is among the most progressive and prosperous in her thousand and one trades and activities.

And now, at a time when it had begun to appear that no more radical changes could be expected in the development of the road transport industry, history is again repeating itself, and the Diesel engine, that little-understood form of mechanical energy, has entered the field of road transport to compete with the petrol engine for the eventual supremacy.

It was sheer necessity that urged the German automobile engineers to redouble their efforts to develop a highly efficient Diesel engine for road transport purposes. Bottled up and remote from the oil fields as they were during the great war, the Diesel offered a substantial measure of relief in the sense that it could consume a comparatively low grade of fuel oil. The increasing reliability, efficiency, and the economic advantages of these engines, focussed the serious attention of the British road transport industry in 1928, when it was made known that the Dewar Trophy was awarded to the Mercedes Benz diesel-engined lorry for the most meritorious performance of the year by an internal combustion-engined vehicle. The remarkable performance of this vehicle had previously engaged the attention of the author, and he was able to report to the General Managers at their annual meeting at Portsmouth, in 1929, that the data available indicated that the fuel costs of operating a double-deck bus in this country with a similar type of engine would be approximately ½d. per bus mile. The subsequent practical experiments by the Sheffield Corporation with a Mercedes Benz diesel-engined bus, and the subsequent experiments of the Walsall Corporation have proved this calculation to be correct.

As the photographs indicate, the Diesel is surprisingly similar to a petrol engine, so much so in fact that many people find it difficult to understand why it can function on heavy oil, and without the electric ignition system and the carburettor of its petrol-consuming rival. Everyone is familiar with the way an old-fashioned cycle pump became too hot to hold after a period of energetic pumping. The same increase of temperature of the air when under compression is made use of in the Diesel. Instead of petrol, a low-grade fuel oil is fed in minute quantities in the head of each cylinder, and ignited by the heat of the compressed air within the cylinder. The explosion which follows drives the piston down, and rotates the crankshaft in the same way as the petrol engine. Engines employing this principle are known as compression ignition engines.

The Gardner engine as installed in one of the Walsall Corporation buses, is a high-speed compression ignition oil engine of English manufacture. The author understands that similar-engined buses are being completed for the Sheffield and Leeds Corporations, and that one or both of these may be available for the Conference.

The complete working cycle of the engine requires four strokes of the piston; that is, two complete turns of the crankshaft. During the first stroke, a charge of air is drawn into the cylinder, and is compressed during the second stroke. At or towards the end of this stroke, a charge of fuel is injected into the combustion space in the form of spray, which is at once ignited solely by the temperature of the compressed air charge. The resultant combustion causes a rise of pressure and a store of energy to be expended during the third stroke or the power stroke. During the fourth and last stroke, the burned gases are expelled and this completes the cycle.

The Gardner engine in use at Walsall is the 4-cylinder type developing 38 brake horse power at 1,000 revolutions per minute, rising to 50 B.H.P. at 1,300 R.P.M. The governor cuts in at approximately 1,350 R.P.M., this being the maximum number of R.P.M. which is permitted at present. The engine is installed in a four-year-old Dennis "E" type chassis (fitted with a 32-seater single-deck body) with, of course, the petrol engine removed. It was intended to fit a 6-cylinder engine, but this was found impossible on the Dennis "E" type owing to restrictions of space.

The following table shows the comparison of the fuel costs :—

| | | |
|---|---|---|
| Single-deck petrol-engined omnibus running 100 miles day per for 300 days per annum :— | | |
| Average number of miles per gallon .. | 8 | |
| Average petrol cost per bus mile .. | 1.625 pence | |
| Cost of petrol at .. .. .. | 1/1 per gallon | = £203 |
| Single-deck heavy oil-engined omnibus running 100 miles per day for 300 days per annum :— | | |
| Average number of miles per gallon .. | 18 | |
| Average oil fuel cost per bus mile .. | .222 pence | |
| Cost of oil fuel at .. .. | 4d. per gallon | = £28 |
| Saving per annum .. .. .. .. | | £175 |

With a fleet of 100 single-deck heavy oil-engined motor omnibuses, the saving of fuel would be £17,500 per annum, of which it should be noted that £6,250 is represented by taxation when using petrol, the oil fuel of course being tax free.

Assuming that petrol was tax free, the saving on present prices would be £11,250 per annum per 100 vehicles in commission.

* There is no well-defined line of demarcation between the various types of so-called Diesel engines owing to the fact that there is a much greater diversity of design than is found in gas or petrol engines, hence the author makes use of the term Diesel in a descriptive sense only.

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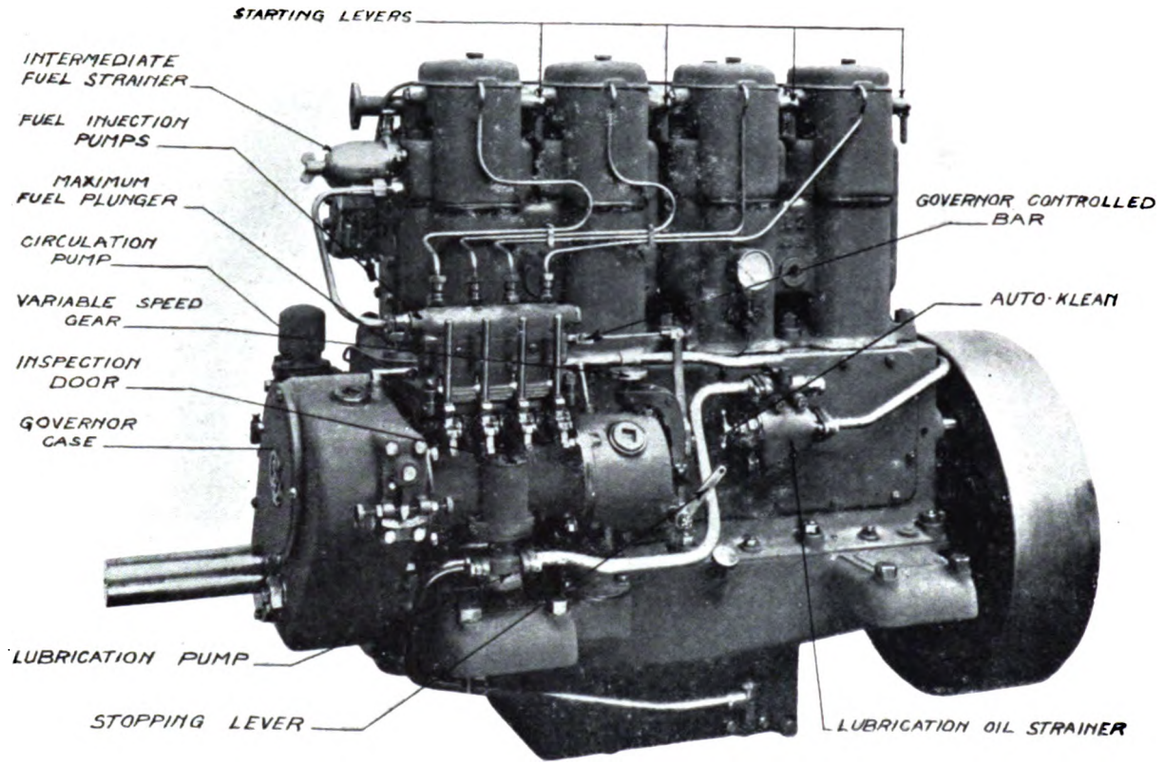
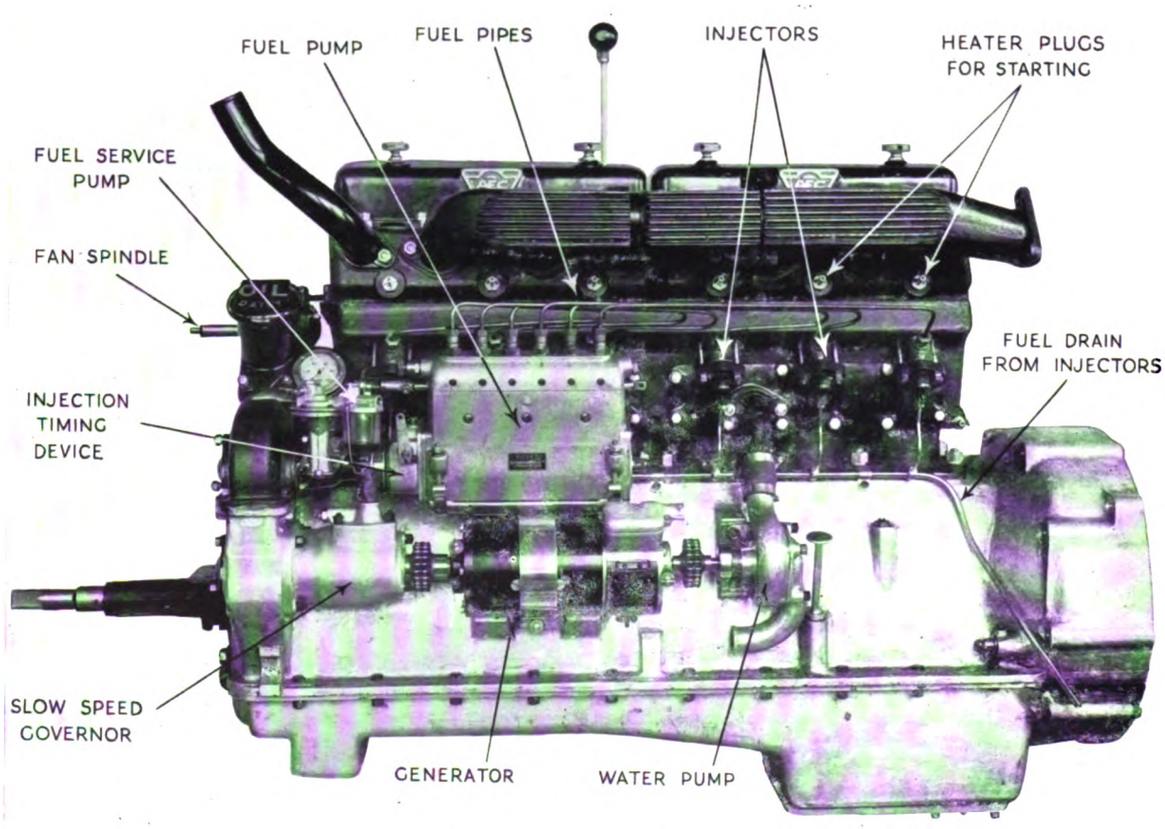



Gardner 4 L 2 Heavy Oil Engine.




A.E.C. High Speed Heavy Oil Engine.

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The consumption of lubricating oil is also superior to that of a petrol engine, largely owing to the lower working temperature of the engine, whilst the quality of the lubricating oil remains good for a longer time because it is not subjected to such high temperatures.

The storage of fuel oil does not entail the same difficulties as those of petrol. The fire risk on vehicles and in confined buildings such as garages is reduced to a minimum, as the flash point of the fuel oil is about 170°F.

The Gardner engine can be driven away from the garage immediately it is started; no warming up process is needed. It can be left running idle for any length of time, the exhaust does not become smoky. The engine is as simple as any petrol engine. In place of a magneto there is the fuel pump, in place of the sparking plug there is the fuel injector. There is no equivalent of a carburettor, and from the point of view of maintenance, any staff that is competent to deal with petrol-engine work would be equally competent to deal with the oil engine. The Gardner engine uses for a given H.P. only about 50 per cent. by volume of the quantity used by an average petrol engine. The petrol engine must therefore burn its fuel in a less efficient manner than the Diesel. Some of this inefficiency is caused by incomplete combustion at low or idling speeds of the petrol engine.

The engine employing the more complete combustion must of necessity liberate less deleterious gases in its exhaust, both on account of its smaller total fuel consumption and on account of the combustion being more complete. The odour from a Diesel engine exhaust is generally less objectionable than the odour of a petrol engine when using many cheap low-grade petrols.

The Associated Equipment Company, of London, one of the largest and best known concerns in the British Automobile manufacturing industry, have for some considerable time devoted a good deal of energy and considerable proportion of their extensive experimental shops to the evolution of suitable high-speed oil engines for road-transport purposes, which have culminated in a number of engines being built on what is known as the Acro system. Extensive endurance tests have been carried out with these engines installed in lorries, and sufficient experience has now been gained to justify the company in putting the first hundred of these vehicles into production for immediate sale to the road-transport industry. The author recently tested out one of these oil-engined vehicles which was carrying a load of 6½ tons when a speed of over 40 M.P.H. was obtained. The general performance of the machine proved to be exceedingly gratifying.

The Acro system employed in these engines may be regarded as a sort of half-way house in the sense that it belongs neither to the pre-combustion chamber engine, nor to the open combustion chamber type. In this system the combustion chamber is divided into two parts of approximately equal volume.

One part of the combustion chamber is directly in connection with the cylinder bore, and the other part is contained in a separate chamber or cell fitted in the cylinder head, and connected to the other by means of a short restricted passage; the shape of the whole combustion chamber being roughly that of an egg in an egg-cup.

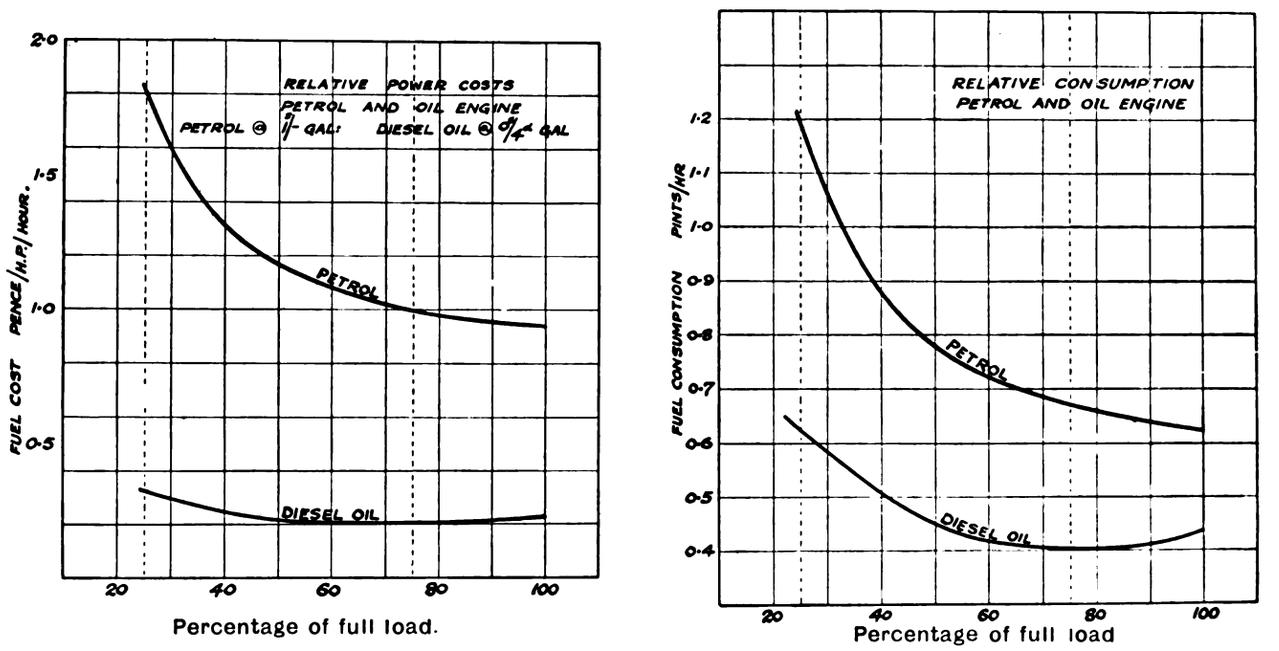
The fuel from the atomiser is sprayed into that part of the combustion chamber which is connected directly with the cylinder, and the spray is aimed towards the passage connecting the two parts of the combustion chamber. The fuel is injected shortly before the end of the compression stroke, the actual amount of advance depending upon the speed at which the engine is running, and varies from about 12 degrees to 25 degrees before the dead centre is reached. The compression ratio employed is 15.5, as compared with about 5.1 for a petrol engine, and the heat of compression is sufficient to ignite the oil. A short interval of time elapses between the commencement of injection and the moment of ignition, but ignition starts before the whole of the fuel has been admitted into the combustion chamber, and the maximum pressure is reached a few degrees after passing top dead centre. Practically no fuel is burned within the air cell, almost all the combustion taking place within the main combustion chamber, which connects directly with the cylinder.

At first sight it is a little difficult to see just how it is that the fuel, after being sprayed directly towards the throat between the two parts of the combustion chamber, is prevented from entering the air cell and being burned there. This is due to the fuel which, being in a very fine state of division, has considerable difficulty in penetrating the highly compressed air (the density of the air being 15 times that of air at ordinary pressures) and this prevents any quantity of fuel from reaching and passing through the throat into the inner air cell.

For starting the engine from dead cold, a heater plug is provided in each cylinder. This consists of a short coil of high-resistance wire, which is so placed as to lie just in the outer edge of the fuel spray. This coil is heated electrically when starting up, the current being cut off as soon as the engine is running. Once the engine is hot, or even warm, it is quite unnecessary to utilise the heater plugs as the engine will fire the moment it begins to turn over. Starting is effected by means of an electric starter, as owing to the high compression pressure and the small flywheel which is necessary on a high-speed vehicle engine, it is not possible to crank the engine by hand fast enough for starting.

The A.E.C. Acro engine has a speed range of 300 to 3,000 R.P.M., the maximum power being obtained at about 2,500 R.P.M., at which speed an output of over 100 H.P. has been obtained.

It will be appreciated that, in the short confines of this Paper, the author is unable to review all the heavy-oil engines which are now being built in this country. From the general data available, he has compiled the following table of the comparative fuel costs.




Compression Ignition Oil Engine 110 x 142 six cylinder.—Associated Equipment Company Ltd.

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Double deck petrol-engined omnibus running 100 miles per day for 300 days per annum :—

| | |
|---|---|
| Average number of miles per gallon .. .. | 6 |
| Average petrol cost per bus mile .. .. .. | 2.166d. |
| Cost of petrol at 1/1 per gallon .. .. .. = | £270 |

Double-deck heavy oil-engined omnibus running 100 miles per day for 300 days per annum :—

| | |
|---|---|
| Average number of miles per gallon .. .. .. | 10 |
| Average oil fuel cost per bus mile .. .. .. | .40d. |
| Cost of oil fuel at 4d. per gallon .. .. .. = | £50 |
| Saving per annum .. .. .. .. | £220 |

With a fleet of 100 double-deck heavy oil-engined motor omnibuses, the saving of fuel would be £22,000 per annum, of which it should be noted that £8,333 is represented by taxation when using petrol, the oil fuel of course being tax free. Assuming that petrol were tax free, the saving on present prices would be £13,667 per annum per 100 vehicles in commission.

The author does not wish to create the impression that the stage of development which has been reached entitles local authorities or the large Motor Omnibus Companies to immediately press the manufacturers for delivery of large fleets of heavy oil-engined motor omnibuses for inter-town or city services. It should be remembered that the latest types of petrol engined buses have reached an exceedingly high stage of refinement, and any attempt on the part of the operators to inflict on the public a vehicle in any way inferior, will be strongly resented. The conditions obtaining in the operation of motor omnibuses on heavy-trafficked town routes are such as to require a highly efficient and refined vehicle, and the heavy oil-engine has not yet reached that high stage of refinement. If any attempt is made to force the pace, and place considerable numbers of more or less immature models on the streets, there is a real danger that hostile criticism may strangle the use of these engines for passenger work, and so retard normal development and progress.

On the other hand, the road haulage industry have no such fears as such a highly refined engine is not so necessary. The Diesel engine, during the process of refinement, should, in the main, serve its apprenticeship in their service. It should also be given a sufficiently lengthy trial in long-distance motor coach or country motor omnibus services, and experimentally, by local authorities, to allow the manufacturers time and breathing space to perfect suitable oil-engines for large capacity passenger vehicles on heavy-trafficked town routes.

Whilst in its fight for the supremacy of the roads, the heavy oil-engine will be materially assisted by its amazing fuel economy. There is still another factor, its immunity from fire, which will weigh heavily in its favour. The fire risk of the oil-driven vehicle is in fact negligible.

If and when the heavy oil-engine can displace the petrol-engine in road transport industry generally, an enormous saving can be effected in the Nation's bill for imported fuel. That the Diesel engine could become an enormous economic force in the gas industry may be realised from the Board of Trade returns relating to gas undertakings in Great Britain. These disclose that out of the 17,887,000 tons of coal carbonised for gas production, some 215,138,000 gallons of tar are made. This would produce approximately 86,000,000 gallons of oil for use if a suitable type of Diesel engine could be evolved for this purpose. Probably a further 60,000,000 gallons would be forthcoming from the coke ovens of the country, or a grand total of 146,000,000 gallons of oil for use in the road transport industry. If and when the low temperature carbonisation of coal comes into its own, this grand total would be greatly increased, as the low temperature processes yield about two and a half times as much the amount of oil for every ton of coal carbonised. It requires little imagination to see what an important part the Diesel might easily play in the rehabilitation of the economic structure of the coal industry and of the country generally.

Whatever may be the future of the electric tramcar or the trolley omnibus, few will be disposed to deny that the internal-combustion engined motor omnibus is destined to find an ever-increasing use in the Municipal passenger transport systems both at home and abroad. It remains to be seen how far the local authorities and the road transport industry generally will support the automobile manufacturers of this country in the development of the Diesel engine. It is such factors as prejudice or encouragement which will fashion the future of this remarkable engine, and will decide whether the petrol age has reached its twilight.

In a few remarks additional to the paper, Mr. Morland said that the Walsall omnibus had completed some 2,000 miles in passenger service without any trouble being experienced, the heavy oil engine being fitted to a Dennis chassis which had previously done many thousands of miles in passenger service with a petrol engine. If he were in charge of a heavy road transport concern he would order no more petrol engines. He was satisfied that the heavy oil engine was quite suitable for that class of work and was more economical than a petrol engine ever could be. A few days ago he had seen a lorry running on gasworks creosote with one of these Diesel-type engines and the results so far obtained clearly indicated that those who visialised obtaining oil from the local gas undertaking had not a "bee in their bonnet."

Finally Mr. Morland said: I should like to say a word with regard to the petrol taxation question. Several of my colleagues felt that I ought to deal further with my research and fuel experiments in the paper. These experiments have proved conclusively that the petrol tax can be evaded wholesale, but I think it will be agreed that it is not for the chief officer of a municipality to get up on a public platform and indicate to the community how a tax can be evaded. That is how I felt on the matter, and it was also the feeling of our General Secretary and one or two of my colleagues. I well remember that in introducing the 1928 petrol tax Budget the Chancellor of the Exchequer, when referring to the uses of petrol and heavy oil said "I am advised by the Government chemist that there is a definite chemical frontier . . ." One or two of us pricked up our ears at the time. If ever there was a chemical frontier it has been hopelessly demolished. Heavy oil can be utilised to a considerable extent in the existing petrol engines in road transport, but presumably the Treasury people will soon deal with the matter. Regarding oil supplies generally, if the country were at war, there is no earthly reason why we should not produce the oil we require from our coal resources. I do not profess to be a political economist, but obviously whilst oil can be bought in such large quantities from the oilfields of the world and delivered at such relatively low prices in the United Kingdom, people will buy the imported oil. But it does seem to me, as a humble engineer, when quietly thinking out these problems, that Great Britain owes its previous industrial pre-eminence in the main to its coal resources, and that until this country can make greater, instead of less, use of its coal resources, we shall have a great deal of trouble to regain the position we previously held.

## THE DISCUSSION.

**Mr. A. R. Fearnley** (General Manager, Sheffield Tramways and Omnibuses): In congratulating Mr. Vane Morland on the valuable paper he has contributed, I would remind members that it is, in effect, the continuation of an informative paper which he contributed to the Managers' Section of the Association at our meeting in Portsmouth in 1929, entitled "Alternative Fuels for Traction Purposes." It was thought by the Executive Council that a word on the practical experience in the operation of the Diesel-engined omnibus working on a Sheffield service for the past six months, would be a useful addition to Mr. Morland's paper. At the beginning of this year the Sheffield Committee believing, as Mr. Morland says, that the economic superiority of the engine could not be seriously disputed, authorised the sending to Stuttgart of a six-wheel Karrier chassis for the fitting of a six-cylinder Mercedes-Benz Diesel oil engine. The arrangements were made by Mr. Goddard, consulting engineer of Leeds, and the work was done by the Mercedes-Benz Co., Ltd., at Stuttgart. The chassis was returned with the engine mounted complete with radiator, ready for service after the fitting of the body. The bore and stroke of the six-cylinder engine are 100 and 150 mm. respectively. The weight of the engine is 16½ lb. per B.H.P., which is about 4 lb. per B.H.P. heavier than the corresponding type of petrol engine. The vehicle was formerly a Karrier six-wheel single-deck 35-seat omnibus, fitted with a Dorman engine 100 mm. by 127 mm. stroke. The same body was refitted, and so far as the passengers were concerned no difference was noticeable. Before the machine was put into service all sorts of predictions were made regarding the troubles that were likely to be experienced. It was anticipated that the starting of the engine would be found to be difficult, that the exhaust would give off objectionable fumes, that seepage or creeping would be experienced with the heavy oil, and that the chassis, and in fact the whole omnibus, would become objectionable on this account. In actual operation these troubles have not been experienced. The engine runs reasonably quiet and has maintained its scheduled service without serious difficulties. It gives an average speed of 12.389 miles per hour on a schedule requiring 187 miles per day. The length of route is 18.584 miles and the running time allowed is 73 minutes. The total mileage in the six months the vehicle has been running amounts to 21,000 miles.

Supplementing the points on page five of the paper, I would say that the fuel oil consumption for the six months has worked out at exactly eleven miles per gallon at a cost of 4¼d. per gallon. The previous results with this omnibus and chassis, comparing, as far as one can, the operating position, were five miles per gallon

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of petrol at 1s. 0½d. per gallon, bearing in mind that this is a heavy six-wheel chassis. Taking the average mileage per omnibus on the system for the year at 33,000 miles, which is our average, the saving in cost of fuel means approximately £247 per omnibus per annum, so that there is a good margin to cover any extra mechanical maintenance which may be found necessary, and I am not here to say that with the Diesel engine some little extra mechanical maintenance will not be required. Apart from the troubles which one must reasonably expect to meet in an innovation of this description, the most serious difficulty which has been found in the operation of this engine is the way in which the lubricating oil consumption has steadily and persistently increased, until, from 700 miles to the gallon, it has, during the last week, got down to about 100 miles to the gallon of lubricating oil. This is a trouble which has caused difficulty with Diesel engines before and on different types of Diesel engines. The reason for this heavy consumption has not yet been ascertained, and we have taken the engine down this week to see if we can arrive at the cause. One would expect a great deal more trace of it at the exhaust than is to be found, and the makers themselves do not appear to be satisfied. The practical operation of the machine has, however, convinced us so far that we are on the right lines, and we have followed the example of our friends at Walsall and Leeds in placing an order for a further Diesel engine, this time of the Gardner type, to be fitted into a Crossley chassis and complete Crossley double-deck omnibus. From what we have seen, we believe that the Gardner engine will give better results and a greater saving that has yet been obtained, and if the road results confirm this opinion, a recommendation will be made to increase this type of omnibus equipment.

The absence of fire risk is a great incentive to pursue this line of development, and all concerned with both road transport and aviation will welcome with great relief an entire equipment suitable for heavy oil fuel. It is unnecessary for me to remind you that we always have this serious fire risk. Whenever you hear on the telephone of an omnibus being ditched, you wait for the next part of the message that it is on fire. We all know that with private cars there have been fires, after which it has been difficult to find out how many passengers there were in the car. It is not always possible to tell, and we must try to entirely eliminate that risk. Mr. Barton, an omnibus owner of Beeston, Notts., is doing excellent work in developing the Diesel engine, having fitted four omnibuses with Gardner engines, and he informed us last week that with the exception of one big-end failure, caused by the dilution of lubricating oil by a fuel leak from a faulty pipe union at the cylinder head, he had had no mechanical troubles, and that he is fitting a further three omnibuses with Gardner engines. Our chief engineer was sent down to Barton's works last week, and he reported on the Barton position as follows:—" The omnibus on which I travelled and on which I had freedom to do almost what I liked, was a single-deck, 32-seater. We ran a distance of twenty miles, many stops being made en route, and 78 passengers were carried during the journey, the scheduled time of 1 hour 15 minutes for the twenty miles route being adhered to. A good road speed was maintained, the maximum reaching about thirty miles per hour. The performance was very satisfactory, with quick acceleration and smooth running. There was a slight engine knock observed at idling speeds. There was no smell whatever and nothing objectionable about the exhaust or from the engine, and at the end of the trip I entered the cab, which was also free from smell and quite cool, and much appreciated by the driver. The easy starting qualities of the engine were demonstrated, and the driver confirmed Mr. Barton's statement regarding the absence of troubles and showed his preference for the oil-engined omnibus, summarising the position in a very intelligent manner as follows: 'There is no re-fuelling en route, the fuel I get in the morning lasts the whole day. There is no water trouble or filling up en route. I have no ignition or carburettor troubles and I find that there is very easy starting and control with good performance on this busy route, and, finally, there are cool and good working conditions.'"

That was the report of the driver who had no good purpose to serve by stating other than the facts. The two types of engine which Mr. Barton is operating are the four-cylinder and the five-cylinder, and contrary to what we used to think, it is found that the five-cylinder type is an extremely satisfactory machine, and there is no reason why, so far as I can see, it should not be used in a certain type of vehicle. The work of development of this type of engine will largely depend upon the initiative of the operators and on the demand which is made by them for this type of equipment. Obviously, in the circumstances this must be so, and it is therefore a matter in which the larger Corporations, who can afford to take their share in experiments of this description, can do invaluable work by obtaining one or two omnibuses equipped with these engines and ultimately calling for a home produced fuel oil to operate them with. Finally, I must say that Mr. Morland is to be congratulated on the tenacity with which he has pursued this line of research and the assistance he has given us in placing before the Conference the views set out in his paper.

**Mr. C. Owen Silvers** (General Manager and Engineer, Wolverhampton Corporation Transport): We are all indebted to the author for this very interesting paper, and I also am indebted to him personally for the opportunity I had of a long ride on his vehicle a few weeks ago. I am afraid that is not sufficient experience to warrant me saying anything definite about compression ignition engines, but I have given the matter some thought from a theoretical standpoint. Few of us have had actual practical experience and perhaps, therefore, you will forgive me for endeavouring, as far as I am able, to sum up the matter. There are a number of advantages from using this type of engine. The fuel costs are less, the fuel bulk is less, we have a smaller fuel tank, the fire risk is reduced, the carburettor is eliminated altogether with the magneto, and high-tension wiring. The size of the radiator is reduced and the after-burning saves decarbonising and the burning of the exhaust valves. Against that, we have certain grave disadvantages. At the present time there is additional weight, which, I understand, is at least 25 per cent., compared with the equivalent petrol engine. There are heavier moving parts with attendant poor acceleration, possibility of damage by racing when the chassis is driving the engine down hill. Again, the engine is noisy, particularly with the detonation when running light. One of the principal difficulties met with in this country and, I understand, also in Germany, is in controlling the maximum engine speed when the vehicle is being driven down hill. The shock with an accelerating engine and a retarding vehicle with its heavy parts will sicken the heart of the most robust of free-wheel clutches. With the progress made in design, weights will be reduced, and I am of opinion that the speed can be successively dealt with by means of our old friend " electric transmission." I expect you are all aware of the progress recently made in this direction, but if you are not, you must come and see my six-wheel petrol-electric omnibus fitted with a four-cylinder Ricardo petrol engine. By means of electric transmission the engine speed can be maintained at, say 1,500 R.P.M., and the whole range of torque and speed can be exercised from the motor from 0 to 4,000 R.P.M. The road wheels and motor having no mechanical connection with the engine and dynamo, overcomes the danger of coasting at high speeds, so far as the engine is concerned. Such lines of development will, in my opinion, eventually evolve a very serviceable vehicle for long-distance work, but I cannot see the compression ignition engine replacing either the petrol motor or the electric trolley vehicle for frequent stop services.

**Councillor Graham Ford** (Vice-Chairman, Leeds Transport Committee): I want to congratulate the author on a most interesting technical and practical paper. I want him to understand that in bringing over to Harrogate, shall I say the latest development of the Diesel engine omnibus, we desired to give the President and members of the Association the opportunity of seeing the latest development. It is with intense pride that I call attention to the vehicle you have seen to-day from Leeds, as being an all-British production. It has not only a British engine, but a British chassis and a British body. The fact that we are able to exhibit it is due to the initiative of British engineers who were determined to put on one side their particular penchant for the petrol engine and to incorporate a heavy oil engine in their chassis and build a British body on the chassis to show what British industry can do.

I am not going to say that I believe that at this time we should put into commission only one or two of this particular type of vehicle. I believe the time is ripe for taking a bold stand and making it clear to our committees that here we have the possibilities of one of the greatest developments that has ever been known in connection with the carrying of passengers in a road vehicle. The reason I say that is because I have carefully discussed the matter with the managing director of the firm who produced this particular vehicle, which is now the property of the Leeds Corporation—and may I be forgiven for saying, without any attempt at advertising, that the Crossley people have been magnificent in their efforts to give us this vehicle and show it to us to-day. In speaking the other day to Mr. Hubble, of the Crossley Company, together with Mr. Horsfield, our general manager, I put the question to him," Is it your opinion that the heavy oil engine has passed the experimental stage?" and he said," Emphatically yes, it has." In addition to that, I believe that Crossley's are negotiating with Gardner's for a licence to manufacture the Gardner engine. Then I said to Mr. Hubble " Would you advise the Leeds Transport Committee to order more machines than this one?" He replied: " Perhaps I would not say go all out for the heavy oil engine type, but I would say that if you are ordering or proposing to order a dozen more vehicles, place an order for half-a-dozen of this particular type."

There are one or two things I would like to mention in conclusion. Mr. Morland stated a fact, namely, that for the propulsion of

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petrol vehicles, we depend very largely on supplies of the necessary energy from abroad. Mr. Morland also pointed to the possibility of providing the necessary fuel from gas by-products. The gas industry at the present moment is labouring under a great disadvantage, owing to the fathering very largely by the Government of the electricity industry. In Leeds last year we lost £60,000 in connection with our gas department, but if we can utilise the residuals of gas manufacture for traction purposes and provide the propulsive force for road vehicles by means of creosote oil, we can put the whole of the gas undertakings in Great Britain on a sound economical and financial basis. It is because of the fact that this particular engine can be driven by creosote oil, and that creosote oil can be produced from millions of tons of waste fuel that exist in the Black Country, that I draw attention to this matter. Around Bilston, Wednesbury, and other parts of the country you can find millions of tons of shale containing bodies which mean propulsive energy and force that can be used for the benefit of the community. Therefore, I do commend to you the fact that here you have a unit which can be of tremendous importance and use to the community, and I say do not turn it down without giving serious consideration to the advantages that it can confer on the whole of the country.

**Mr. J. M. Calder** (General Manager and Engineer, Reading Corportion Tramways): I feel sure I am voicing the sentiments of my colleagues in thanking Mr. Vane Morland for this very interesting paper. It is a new subject, and there are many features which must appeal to the engineer and manager in connection with this new prime mover. To my mind the basic point is the high thermal efficiency of the unit itself, and that is the reason, I think, which has prompted many engineers to study the matter and promote and further the interests of this new engine. I have heard some of the criticisms of this engine, but I am old enough to remember also some of the harsh things said in the early days about the petrol engine. When we look to-day, however, at some of the results that are attendant upon the development of the Diesel oil engine, I think there is something to be said for its advancement from that point of view. It is a good thing to know that the designers of this type of engine are practically of another school. Some exception has been taken to the enormous weights of these engines, but after all is said and done, those of us who have had some experience in the repair and maintenance of the petrol engine will not take such strong exception to this additional weight, having regard to the rapid wear and tear that is taking place, particularly in the bearings of the petrol engine. I for one would be glad to think and to know that the designers of the Diesel oil engine are going to give us a little more allowance in that particular part of the engine. Ample provision, I think, will have to be made because of the enormously high working pressure that has to be maintained, if the engine is to do its work, and, therefore, allowance will have to be made in taking into consideration the repairs and maintenance of the engine. That brings us back to the point of fuel. A great deal has been said as to the price of oil fuel going up, and that probably the price of petrol will go down, so that you will get a balancing effect. Nevertheless, we have a large margin available, and my point in conclusion is that it is not so much the cost of the fuel, as the value that lies in the fuel itself. I think there is something to be said for looking into the future from that point of view. The efficiency that we get out of a gallon of petrol is a long way behind the value that lies in a gallon of fuel oil.

**Alderman T. Woffenden** (Vice-Chairman, Huddersfield Tramways Committee): I do not want representatives of municipal authorities to approach this matter with anything like the jealous mind that was experienced in various conferences in the early days when the motor omnibus was coming into prominence. We are face to face here with a new proposal with regard to engines, and I want to see full and fair consideration given to it, because it means so much to us as municipalities. Our managers are trying to get all they can out of the mechanism that is available, and therefore this new engine must commend itself to us from that point of view. With regard to petrol, we have been the shuttlecock of every Chancellor of the Exchequer in the matter of taxation. It may be argued that he will tax the heavy oil as he taxes petrol, but you know that when the late Government attempted to tax paraffin they had to drop the proposal. In the same way I fancy that Governments will not find it as easy to squeeze money out of taxation of heavy oil as they have out of taxation of petrol. Even if taxation is put on to this oil, it will bring down the price of petrol. We are faced to-day with the position of being forced into a combine, so far as petrol is concerned, which results in our not getting that commodity at what we would consider is a fair and reasonable price. It is only in so far as there is healthy competition that we shall get the price of that commodity down, and here we have a proposal which will enable us to make use of heavy oil produced in our own country. There has been experience at Walsall, Sheffield and Leeds, which convinces me that there are great possibilities in this new engine, and I want the members to face the matter with an open mind and be prepared to give the engine a trial, so that others will be encouraged to produce a fuel for transport purposes which will free us from the bondage of the petrol combine.

**Mr. A. C. Baker** (General Manager, Birmingham Tramway and Omnibus Department): I should like to congratulate Mr. Morland on the pioneer and experimental work he is carrying out in connection with this development. Despite what the last speaker has said, however, I think if there is a general use of heavy oil there must be some increase of price. No doubt there will be some considerable saving in fuel costs even then, but I want to make this point. When the author's experiments were first noted in the papers in our district, one paper came out with a big heading, "The Doom of the Petrol Engine," and everybody in Birmingham said that if we could run our omnibuses with heavy oil engines we ought to be able to reduce the cost of transport by half. As a matter of fact, that would be quite impossible, even if we had no engine at all. A point upon which I would ask the author for information is in regard to acceleration. Both the author and Mr. Fearnley are operating their omnibuses on long-distance services, and are not making stops such as we have to make in the busy portions of a big city like Birmingham. I am wondering, therefore, if the Diesel-engined omnibus operating in busy areas with frequent stops, say, six to the mile, could still maintain a reasonable schedule.

**Mr. R. L. Horsfield** (General Manager, Leeds Transport Committee): I think the author is too modest in his estimate of the saving that will be made by the use of these engines. He speaks of an omnibus running 30,000 miles per annum, but in the North we do 40,000 per annum per omnibus. Therefore the saving will be increased in the course of a year by the use of a heavy oil engine by perhaps another £150. I understand the author, together with Mr. Fearnley, has been experimenting for some time with these heavy oil engines, and you have heard from my Vice-Chairman this afternoon that in Leeds we have just bought an engine and a complete vehicle which has not yet been in service. I should, therefore, like the author to tell me if he can, having regard to his experiments, what trouble, if any, he has experienced with the heavy oil engine, as compared with the petrol engine, and I should also like to know what is the difference in thermal efficiency between the heavy oil engine and the petrol engine. I believe that with this new vehicle at Leeds we shall prove that the Diesel engine will be economical in service, and able to do all that is claimed for it. But if one can get information from those who have already had some experience with these engines over a period of time, I am sure the delegates would be delighted to have it.

**Councillor I. Brassington** (Chairman, Manchester Transport Committee): Can the author in his reply give us any idea as to the comparative life of the heavy oil engine and of the petrol engine?

**Bailie Peter Burt** (Glasgow): I also should like to congratulate the author on his valuable paper, because it is a very difficult thing to deal with such a subject before an audience composed partly of technical experts and partly of laymen. There is one point I should like to emphasise, and that is after a life-long experience in trying to develop internal combustion engines, I have found that one of the greatest difficulties to be considered is the question of the expenditure which must be incurred in developing such new ideas as those which have been described by the author. The question in this case, as in many others, is who is going to face the bill for the work which must be yet carried out before the heavy oil engine can find its full application to road transport purposes? I think that an obligation rests upon us as municipal representatives in this matter, and that we should be a little generous in support of those who are trying to make these improvements. This experimental work cannot be carried out without a great deal of expense, and the manufacturers individually cannot be expected to carry out extensive experimental work when they have very little chance of a monopoly after they have successfully carried out the work. My experience has been that the possibility of covering any development in internal combustion engine work by a patent is very remote indeed. I myself once went through a very long patent case in the Chancery Court, in connection with the internal combustion engine, and I do not think there has been anything in connection with such work that has not been anticipated in some patent in some form or other. Therefore, I think the municipalities should open their purses very generously and assist those firms who are carrying out this experimental work upon the heavy oil engine for road transport, and give them every encouragement. There is no doubt that there is a great future for this type of engine, from which the municipalities will eventually derive enormous advantages. The development that has already taken place with the heavy oil engine in marine propulsion is an indication

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of that. I know that the Gardner and Crossley people, and many others, have been spending thousands of pounds in trying to solve this problem, and whilst they appear to be getting nearer to a solution every day, there is a great deal of work yet to be done, and every encouragement should be given to them by those who will eventually become large users.

**Mr. R. H. Wilkinson** (General Manager, Bradford Corporation Tramways): I should like to congratulate Mr. Morland upon his excellent paper. As a mechanical engineer originally, with a considerable marine experience, this type of engine for road transport appeals to me immensely, because it seems so much simpler than the petrol engine. I should like Mr. Morland, however, to explain how it is that the engine uses less fuel than the petrol engine—I believe he says 50 per cent. less—and why that oil is so much more economical and efficient than petrol. Is it because it is more elastic in its explosion and therefore its pressure follows the piston more to the end of the stroke, as against the sudden explosion of the petrol engine? I also believe this engine is somewhat difficult to start, due to the high pressure of the compression.

**Mr. Fearnley:** Not a bit.

**Mr. Wilkinson:** I also understand that some power is required to start the engine.

**Mr. Fearnley:** No.

**Mr. Wilkinson:** Thank you. I suppose the low speed at which the engines run is the reason for the extra weight and that rather brings me to the point which Mr. Silvers brought out. If you are coasting down a gradient with that engine running at such a low speed and the engine is acting as a brake on the vehicle, the engine would have the tendency to be over-run and I should think it would be rather destructive to it. With regard to the question of the present staff being capable of looking after this new type of engine, there can be no question about that, because the engine is so much less complicated, and would be much more easy to understand. I notice that on page six of the paper, mention is made of an air cell. What is the idea of that air cell? Has it some effect on the compression, or what is its purpose? A self-contained vehicle from a tramway manager's point of view—especially when his duties are divided up between different officials, such as is the case in many towns where the track is under one official and the supply of electricity under another—is the ideal, because the manager of any concern would have the whole of his job in his own hands, and from that point of view the new engine is very attractive. If it has good acceleration, is quiet and clean, I can see a great future for it. It all depends, however, on the result of these experiments, and, at any rate, I hope it has a good future, and I wish it well, because it appeals so strongly to the tramway manager in affording a self-contained vehicle.

**Councillor T. H. Burton** (Liverpool Tramways Committee): As a layman, I am not going to say much with regard to this new engine in relation to land vehicles, but I am connected in Liverpool with a firm which had ten steam-driven barges. Some eighteen months ago we converted one of these to Diesel-engine drive and have been so satisfied with the saving at the end of three months running that we gave orders to convert the other nine. I can assure you that the saving we are making on these barges fully justifies this step. The boat that has been running for eighteen months has already paid for its installation by the savings made in running costs, and all the others look like doing the same. There can be no doubt that if these engines become an accomplished fact for motor omnibuses, the savings will be beyond anything that you have calculated for so far.

**Mr. G. Rock** (General Manager, Lincoln Corporation Transport): There is one point I am not quite clear about and that is on page four of the paper with regard to the r.p.m. The author states "the governor cuts in at approximately 1,350 R.P.M., this being the maximum number of r.p.m. which is permitted at present." I would be very much obliged if Mr. Morland would explain these last two words "at present," and say whether it is his opinion that the governor will be eliminated on this particular engine, because if it can be eliminated I do not see any reason why this engine should not be the great thing of the future.

**Councillor O. M. Flinn** (Chairman, Coventry Tramways Committee): The author states in the paper that "starting is effected by means of an electric starter, as, owing to the high compression and the small fly-wheel which is necessary on a high-speed vehicle engine, it is not possible to crank the engine by hand fast enough for starting." Does this obtain in the Crossley and Gardner engines also, and, if so, is it not a disadvantage, because, if the starter goes out of action, how would the driver get on?

**Mr. Vane Morland** replying to the discussion said: I think Mr. Fearnley's experience is precisely what we have found, i.e., that we shall require to run between 20,000 miles and 30,000 miles in services before we find out what we are up against as far as maintenance is concerned. Mr. Fearnley and I have discussed the matter and I do not regard it with any degree of alarm at all. We have to realise that this particular engine came to Sheffield a complete stranger. Everybody has had to get used to it, and it takes the employees some time to get their bearings in these things. We had all these troubles in the earlier history of automobile work and well I know them. There is no cause to worry about it and I do not think Mr. Fearnley desired to create that impression.

**Mr. Fearnley:** Certainly not.

**Mr. Vane Morland:** I think that just a straight overhaul will be required. Mr. Fearnley has mentioned Mr. Barton. I know him very well. I can see him now with his yachting cap on. Barton has been a pioneer all the way through in automobile work. Some of you will remember perhaps, during the war, that he was one of the first people to make use of gas bags owing to the shortage of petrol. Barton has one of the keenest brains on the engineering side of the industry. He was very quick to recognise the potentialities of this engine and his experience will be extremely valuable not only to the members of the Association, but also to the road haulage industry generally. The five-cylinder type of engine which Mr. Barton has in service has rather taught some of us that we did not know all there was to know, much as we thought we did, about the effective number of cylinders and balancing of engines. Mr. Fearnley says that Corporations should put several of these omnibuses into service. It is the obvious thing to do, but these machines must be put into service where they are going to get proper skilled automobile attention. A purely tramway operating authority must not expect the machine to be looked after by the handy men who service the electric tramcars. Some corporations have, in changing over from tramways to omnibuses, not sufficiently recognised the fact that the motor omnibus requires an entirely different type of skilled craftsman to look after it. The same applies to this engine.

Fuel costs, the bulk of fuel to be carried, and the absence of fire risk were mentioned by Mr. Owen Silvers. We are faced with the fact that in the Black Country, which includes for this purpose Coventry, Birmingham, Walsall, Wolverhampton, Wednesbury, Darlaston, Bilston and the other Black Country towns, no less than 5,000 tons of precisely the same fuel oil as we are using in these engines to-day is used every month in muffle furnaces, tube hardening, and other auxiliary work, common to industry. The taxation of this oil will present serious difficulties to the Treasury—very serious indeed. If they make any attempt to impose a tax on fuel oil, they will at once place a considerable burden on many important industries. I do not suggest for a moment that we are entitled as operators to expect the use of the roads free. For that reason in the paper I dissected the petrol tax in the fuel cost data. However, it is not beyond the wit of man or the Treasury officials to devise a scheme whereby the oil-driven vehicle pays taxation as a vehicle. It has been done before and it can be done again.

**Mr. Beckett** (general secretary): Will you explain what you mean by "taxation as a vehicle"?

**Mr. Vane Morland:** I mean that we are already taxed according to the seating accommodation of the omnibuses. It is a sliding scale and the same principle can be applied to the maixmum laden weight ratio of lorries. If it is an oil fuel driven vehicle, we shall simply pay more. So far as I can see there is nothing that need worry the Civil Service or Inland Revenue people.

Then with regard to the possible increase in price of fuel oil. You have to realise that if we worked all municipal transport of the country on oil fuel, we should be using very little more than the quantity used by one or two of the large liners in the course of an ordinary voyage. The aggregate amount of fuel oil that could be consumed on road services is a flea-bite compared with that used in shipping and industry generally. I cannot for the life of me see how the Treasury can tax fuel oil as such, unless they give a rebate to those who are not using it for transport purposes, which is not an easy proposition and could easily be subject to abuse. If the price goes up we have still the advantage that we can run far more mileage to the gallon of fuel oil than from petrol, whether the fuel oil is from coal or petroleum. Moreover, I believe that the oil engine will ultimately prove the more efficient engine. Mr. Silvers mentions that there is no burning up of the valves. That is due to the fact that the heat is not so intense as in the petrol engine. With regard to the additional weight: When we wanted to get on with the job in Walsall, we were faced with the fact that there was no manufacturer putting up a proposition of this character other than the German Mercedes-Benz people. We then obtained all the available data from Mr. Fearnley's Mercedes-Benz experiments. We then tried to obtain an English proposition but the only English engine available at that time, which we considered suitable for converting for passenger purposes, was a marine engine.

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Hence we bought this marine engine. We took the engine into our works and, with our own staff, built it up on a special sub-frame, re-designed the fly-wheel and made up a set of control gears suitable for the driver's cabin. We have tried it out successfully, but it is still a marine engine, and for Heaven's sake do not start criticising the weight of the engine until it has been re-designed for automobile purposes. It is all a matter of evolution. The Diesel engine, however, is an engine which will require more weight per h.p.—what we call power/weight ratio—than the petrol engine. I have long been of the opinion that the petrol engine people have skinned the weight of the petrol engine down too much. The petrol engine is in danger of becoming tin-pot. I should have preferred to have kept the engine more sturdy from the maintenance point of view. As to the noise of the oil engine when idling, that again will be a matter for experiment, probably by trial and error. As a matter of fact when we placed this converted omnibus on our ordinary service the noise was not noticed by the pedestrians, whilst the passengers did not know they were being driven by an oil engine. The matter leaked out accidentally and resulted in the article to which Mr. Baker referred. It was undoubtedly due to one of our men talking to a Press man, who, having got the story, rushed it into print. Up to that time we had not made any official announcement at all. With regard to electrical equipment, Mr. Silvers there makes a valuable suggestion and one which curiously enough we have been talking over in our own works. We have an old petrol electric chassis and we looked round to see whether we could fit a heavy oil engine into it, but I am afraid we cannot. We shall have to start from the ground floor and re-design the petrol-electric chassis with the oil engine in it as a complete job and so I cannot say anything further at the moment. I think there is quite a lot in what Mr. Silvers said in that respect, however. As to the speed, also mentioned by Mr. Silvers, there again we do not want to rush the manufacturers of these engines at the moment. We had the governor set at 1,350 R.P.M. and after a trial, with the chief engineer of the Gardner Co., aboard, he expressed the opinion that we might go up to 1,500 R.P.M. That engine, however, will be entirely re-designed as an automobile job. I say that it is a very wonderful engine and an outstanding product of British engineering brains and a credit to the company who made it.

With regard to the A.E.C. proposition, they are working on entirely different lines. The A.E.C. people believe more particularly in the high-speed engine with its presumably higher acceleration, which is a feature of the latest type of London omnibuses which they manufacture. The A.E.C. proposition is quite a sound job. As regards running away down hill. I do not think there is any need to worry about a vehicle running down hill. Every now and again you get nervous councillors or somebody shrieking about what would happen if a tramcar went down hill and a driver could not stop it. The human element will always be present. With civilised life as it is to-day, there is quite enough to think about without wondering what might happen. Certainly anything of this sort cannot happen any more with a Diesel engine than it can with the petrol omnibus. With the oil engine there is the extraordinary advantage that if the omnibus turns over it cannot by any stretch of imagination catch fire.

I want to compliment the Leeds Corporation and Mr. Horsfield in particular on the very fine job they have made of the omnibus which they have brought here. It is a very fine vehicle indeed, and I say to the Leeds Corporation and the Leeds citizens that they ought to be extremely proud of their Transport Department and the people concerned in being able to produce such a magnificent vehicle with such a fine performance at such comparatively short notice. It is interesting to have the assurance of Councillor Graham Ford that the new Gardner oil-engined omnibus we have seen outside the Conference Hall, has cost less than a petrol unit. Councillor Graham Ford also said he would not restrict the number of such vehicles. Frankly I do not agree. A public authority running a transport service is in a vastly different position at present than a private company. In the case of a private company you put up a proposition before the Directors who realise you have occasionally to take on what is known as a commercial risk. If your proposition is approved, the Directors and the company take the risk. If, however, you go to a tramway committee and you say "Gentlemen, I think this will be all right, and I think we ought to go in for it," and anything unforeseen happened, the committee concerned would be subject to an attack on the floor of the council chamber. The local papers would no doubt think fit to deliver a lecture on the folly of spending public money and the public confidence would be destroyed. Therefore public authorities should go cautiously. There is plenty of time, and after all what is five years in the life of transport. It may be that we shall never perfect this engine up to the degree of refinement which obtains in the latest type of petrol engine, although we have got over half way. Unfortunately the average manager cannot devote sufficient time to experimental work. He has to do his experimental work in his own spare time and it seems a pity that there is not somebody who can devote his whole time and energies to fuel experiments on a much greater scale. There is no organisation, so far as I know, conducting any extensive experiments. It seems a subject which should be gone into, having regard to the vast amount of motor spirit that is being used every day of our lives. What, for argument's sake, would a sum of £200 or £300 a year in subscriptions mean to any of the large corporations, if we are going to get a substantial saving in fuel costs from the expenditure of such money on research. I think it would be well if we could get some really practical research work started. We shall only make progress by research, experiment and trial and error.

The question of thermal efficiency was mentioned by Mr. Calder, but I am sorry I have not the precise figure with me. I will give it to him later. Mr. Calder also dealt with the weight ratio of the two engines and made the point that I have just mentioned, that petrol engines have been cut down seriously, and some of us think too much. I hope the makers of Diesel engines will not strive to cut the weight of the engine down too far as has sometimes been the case in petrol engines. Give us a sturdy engine, one that will stand up to its job and can be kept properly serviced and properly maintained. Mr. Calder also asked whether costs will go up. I say let them go up; if we can get twice as much mileage from a given engine on oil as we can on petrol, there is a considerable margin for a rise in cost seeing that oil at the moment is only one-third the price of petrol. In any event assuming that it cost the same to propel an oil-driven omnibus as a petrol-driven omnibus, is not the point that it is fireproof worth consideration? After all do not forget that we are carrying human beings.

In reply to Councillor Woffenden, I can only repeat what I have already said that you must not expect to get through without taxation. You must be prepared to pay for using the road. I think everybody will agree with that, and whatever immediate tax free fuel advantage you get from employing these engines will be speedily and suitably dealt with by the Treasury.

Lack of acceleration was mentioned by Mr. Baker. With a petrol engine you have a very lively and responsive engine at short notice. The torque of the Diesel engine is entirely different, it is more in the nature of a steam engine. It gives you the idea, when you are handling the throttle, that it gets right down to its job. It takes a little longer to do so than the petrol engine and your drivers, the moment they handle the Diesel engine, will remark upon the different feel and touch of the engine as compared with the petrol engine. As to troubles with the omnibus we have had none so far. The drivers have had to work this Diesel-engined omnibus when it came on their shift. No special tuition or explanation has been necessary. It has, in fact, gone into service just like an ordinary omnibus. On the country service speedy acceleration does not so much matter. I agree with Mr. Baker that on city services high acceleration is very valuable and enables a vehicle to nip in and out of the traffic quickly. We are yet in the early stages and I think we shall gradually improve on the acceleration, but it cannot be regarded as poor now.

It was said by Mr. Horsfield that I have been too modest in my estimates. Frankly, I think I have. I wanted to keep on the conservative side. I have kept everything to the minimum. I admit that in our own case we considerably exceed the 30,000 miles queried by Mr. Horsfield, and no doubt that is so in most systems. On the other hand, there may be some who are actually down to the lower average mileage mentioned in the paper.

The comparative life of the two types of engines—on which information was sought by Councillor Brassington—is a difficult one to answer at the moment. The engine we are using in Walsall for automobile purposes was primarily designed as a stationary and marine engine, and the conditions under which an engine works in these two cases are vastly different and necessarily call for some difference in design. It is difficult to give any estimate of comparative life until we have had sufficient experience of an engine designed and constructed specially for automobile passenger work in service, say 30 to 50,000 miles. I see no reason why we should not ultimately get even better results with this engine than we are now getting with the best of petrol engines. Somebody took me to task for not getting a manufacturer of this country to manufacture a vehicle for us, but my answer is that one was not available. I was in the same predicament as Mr. Fearnley.

**Mr. Fearnley:** Exactly.

**Mr. Vane Morland:** We could not buy a vehicle and we started in the way I have described. If any manufacturer had expressed his willingness to have fitted up a vehicle of this description we should have been prepared to work with him, but at that time there was no one in the offing at all, and so we got on with the

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job ourselves. Otherwise I agree that the municipalities and the manufacturers should work together and share the cost of the experimental work. I looked at it in this way. The cost of our engine will not hurt us because we shall speedily save it in fuel and the experiment will not have cost my corporation anything. When you come to carrying out large scale experiments, however, altering the design and so on, large sums of money are involved and it is up to the municipalities to assist the manufacturers. I happen to know Bailie Burt's experience. He was one of the pioneers of the internal combustion engine. He did not tell you, but he was the inventor of the sleeve-valve engine, and that we in the automobile world will always regard him as a genius. He had the painful experience—after wracking his brains and energies for a considerable period and producing what at that time was an epoch making engine—of seeing other nations and other people copy this engine extensively, whilst apparently he had no legal remedy. That was his reward for the pioneer work he put into automobile engineering. It was a very bitter experience and I sympathise very much with him. As Bailie Burt rightly points out, it is no use expecting the manufacturers to push along and endeavour to produce a perfect engine at their own expense to enable their rivals to manufacture free copies of the engine in their works. The automobile industry should get together as a whole and pool their experimental work. That might probably be the best solution. I hope they will realise that this engine is going to have a very important effect upon our export trade, because various countries overseas are now clamouring for an engine of this character, due to the fact that petrol is such a luxury in many countries.

Reference was made by Mr. Wilkinson to the fact stated in the paper that the heavy oil engine consumes 50 per cent. less fuel for the same work done. I will not indulge in another technical argument about this, but it is simply due to the fact that with the Diesel engine you do not work on a mixture, the speed of your engine is decided entirely by the amount of fuel that you allow to go into the engine. The air pressure is constant, or relatively so, and if you do not want engine power you close your jets accordingly. As far as the combustion that takes place is concerned, that is very much more efficient than in a petrol engine for the reasons I have explained in the paper. Combustion takes place more gradually, more surely and more completely than it does in a petrol engine.

The information given by Councillor Burton as to the use of Diesel engines on boats is very interesting. This is a matter, as perhaps you are aware, that has occupied attention to a considerable extent on some of the inland waterways. This engine is also playing an increasing part in connection with small lighting sets for country houses and the like. In my opinion it will be a very formidable competitor in the production of cheap electrical energy. In certain circumstances it will be cheaper than the power the much boomed National Grid system will be able to supply.

As regards the question mentioned by Mr. Rock, the point is that we do not want to do anything which the manufacturers do not approve of. The manufacturers said they would set the governor at 1,350 R.P.M., and we have been able to get approximately 30 miles an hour with the governor at this setting. We thought we had better leave well alone because if we started speeding the engine up—for argument's sake to 1,750—it would be our funeral and not the manufacturers. At the moment the engine is running with the manufacturers' full guarantee and they will deal with any faults that may arise.

I am sorry I did not make myself quite clear with regard to the starter question mentioned by Councillor Flinn. I have been dealing with two engines. The Gardner engine can be started up by hand by lifting or taking nearly all the compression off. When the engine is running you restore all the full compression. The A.E.C. engine is a very high speed engine and is started on a high compression. It is impossible to start it by hand unless you fit a special geared starter. The A.E.C. starting gear is a quite plain and straightforward job. On the general question of maintenance I still say that if you have an engineering staff fully competent to deal with petrol vehicles you need not have the slightest hesitation in committing the Diesel engine to their care. I think you will find that once they have got over their suspicion and conservatism—which incidentally greets every new-comer—they will be quite delighted with the engine. After all is said and done, some of the petty irritations to which our staffs are subject at the present time, such as magneto trouble or oiled up plugs, do not happen in the case of the Diesel engine. The oil engine jets may get stopped up but the oil is injected into the cylinders under such a pressure that the jets are not likely to choke up very frequently.

On the motion of **Bailie P. J. Dollan** (Glasgow), seconded by **Alderman Hill** (Burton-on-Trent), a hearty vote of thanks was accorded to Mr. Vane Morland at the conclusion of the discussion.

### VOTE OF THANKS TO THE PRESIDENT.

**Alderman G. Banton** (Chairman, Leicester Corporation Tramways Committee): It is now my pleasure and privilege to propose a hearty vote of thanks to our President. This has been an historic year, and we all appreciate the services which the President has rendered during the past twelve months, in conjunction with the Minister of Transport. We have been very fortunate to have had men of such vision, courage and enthusiasm as those who have given their services to the Association in the past. We appreciate what they have done, and for that reason we cannot let this opportunity go by without expressing our thanks to our retiring President, Alderman Canby, for the work he has done during the past year, and for the great success that has attended his efforts. The resolution I have to propose is in the following terms:—

"That the most cordial thanks of the Association be accorded to Alderman Thomas Canby for his zealous and self-sacrificing services in the office of President during the year 1929-30, and that this resolution be engrossed on vellum and presented to him in album form."

**Alderman A. J. Dobbs** (Chairman, Leeds Tramways and Motors Committee): I have the greatest pleasure in seconding that resolution. I came to this Conference for the first time with a great deal of interest, and having listened attentively to all that has been said, it is impossible not to appreciate the enormous amount of work which the Association is doing for the transport industry every year, and the many duties that devolve upon the President of the Association. Those of us who take part in municipal service appreciate the enormous amount of good work which an Association of this kind is able to do and has already done. It is only forty years ago that people were riding about on high bicycles, and when we look at the developments that have taken place since, with the Diesel engine as the latest improvement, we see at once with what rapidity those who watch over the interests of transport in any form have to think and act. This is the first conference I have attended, but I hope it will not be the last.

The vote of thanks was carried with enthusiasm.

**The President:** I am extremely grateful to you for this vote of thanks. When one is elected by his fellow members to such a high position as that of your President, he feels he is having a great responsibility thrust upon him. Since I first started in public work many years ago, I have always taken a great interest in all public services, but more particularly in the transport service. In the old days it was just a tramway service, and therefore the work I knew I should have to do as President was congenial to me, and I also went into it with great confidence, because I had had some experience of members of the Council. They were men who knew the business of public transport and of the Association, and I knew I could depend upon their support. We have had many important matters to deal with, but I will not attempt to enumerate them. I will say this, however, that I have had the greatest assistance from every member of the Council. Further, it was a great pleasure to see so many members at the meeting at Caxton Hall, and to note their enthusiasm about the fate of our Bill and the way it was dealt with at that time. I have had a very pleasant year and have enjoyed the work. At times it has been hard and it has been necessary to make certain sacrifices, but we all have to do that; and I have really gained a great deal of pleasure from it. Before I close I want to say how delighted I am that Mr. Bellamy, of Hong Kong, has been able to arrange his holidays so that he could spend a few days with us at the Conference. I say this more particularly, because he was so kind to me when I was going round the world three years ago. He entertained me like a prince in Hong Kong, and the impression I got was that he has the right job.

There is one other matter I must mention before I conclude, and that is the services of our general secretary, Mr. Beckett. No association, I do not care what it is, can have a better secretary, a more active secretary and a secretary who understands his job and knows how to handle other people better than Mr. Beckett. I do not know what I should have done this year without him, and although you all know him fairly intimately, I can say that when you get closer to him you come to value his work, his knowledge and his tact, as the Minister of Transport mentioned at the dinner last night. I wish to express to him my sincere thanks for all the help he has given me, and I want every member to appreciate that Mr. Beckett is the life and soul of the Association. Another matter I must mention is the manner in which the attendances have been maintained at the Conference. This Conference meets to discuss serious matters relating to transport, and it is a real pleasure for the President and officials to look from the platform on such a crowded room at the end of the Session. I thank you once more for your kind vote of thanks.

The Conference then closed.

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## THE ASSOCIATION'S ANNUAL DINNER.

The Annual Dinner of the Municipal Tramways and Transport Association was held at the Majestic Hotel, Harrogate, on Wednesday, September 24, covers being laid for over 400. The President (Alderman Thomas Canby, J.P.), was in the chair, and the guest of the evening was the Minister of Transport (Mr. Herbert Morrison, M.P.).

The Loyal Toast having been duly honoured,

**The President** proposed "The Minister of Transport," and expressed the great pleasure of the members of the Conference that Mr. Morrison had been able to attend their Annual Dinner for the second year in succession. Continuing, the President said that twelve months ago they were expecting the second part of the Royal Commission on Transport with some impatience and the hope that the lot of the municipal operators would be improved and that they would obtain, at any rate, some equality with their competitors. As an outcome of the deliberations of that Commission, the Association had during the last session of Parliament achieved a marked success in securing the second reading of its Omnibus Bill. The first draft ot the Bill had been presented to Mr. Morrison on October 18, and it was read a first time in the House of Commons on November 1. At that time Mr. Morrison was preparing a Road Traffic Bill for first reading in the House of Lords, and in order that the Association might have two strings to its bow, they included the Omnibus Bill in Part V of the Road Traffic Bill in a modified way. The Road Traffic Bill was read a second time on December 5, in the House of Lords, but in Committee on December 18, Part V was struck out by the remarkable vote of 24 to 11. Meantime, the Association was busy in the House of Commons with its Omnibus Bill which was read a second time there on February 2, obtaining a majority of 85. That was a day

Mr. Herbert Morrison, M.P.
*Minister of Transport.*

of great rejoicing for municipal operators, and on February 20, the House of Commons directed the Standing Committee to consolidate the two Bills. At one stage they were in a dilemma owing to procedure in consequence of the presence in Parliament of two Bills in the same session relating to the same subject. Mr. Morrison did not get all he wished for, but those who remembered something of the strength of the opposition to this part of the Act would appreciate the benefits gained because, after a titanic struggle, municipalities no longer had to go to Parliament and spend large sums of public money to obtain powers to run vehicles. The procedure would be simplified very considerably. Then again, the Act would prevent private competitors from employing omnibus drivers and conductors for unreasonably long hours and at exceptionally low wages, and this would have its effect, it was hoped, in preventing some of the undercutting in fares that had been taking place and, moreover, shorter hours would undoubtedly lead to greater safety on the roads. The municipalities did not get all they wanted by a long way, but they got a great many things which would be of much assistance to them. A great responsibility rested upon municipalities as transport authorities and he was certain they would not wish to amble along in the same sweet way as they did before the days of the internal combustion engine. He was convinced there was a great future before municipal transport and believed that municipal undertakings desired to meet the needs of the travelling public by co-ordination, and in many other ways because it was only in that way they could ensure success.

### MR. MORRISON'S SPEECH.

**Mr. Herbert Morrison, M.P.** (Minister of Transport), responding to the Toast, said the last Annual Dinner of the Association was, he believed, the first public dinner which he attended after his appointment as Minister of Transport, and he had very happy memories of that occasion. He remembered with what restraint and even nervousness he affirmed his belief and hopes in municipal transport, and he was afraid he did not think at that time that between then and now the municipalities and himself would have achieved a triumph for municipal enterprise which they had long sought for. On the present occasion, therefore, he was pleased to be among them in such special circumstances, and indeed it was nice to be in Harrogate, if only to forget the appointment of traffic commissioners. Every mail brought him in a regular and proper way applications in this connection, and every mail also brought applications marked "Private and Confidential," not only to Whitehall, but to his home address. One such application had come to him under a covering letter to his wife, apparently in order that the permanent officials should not interfere with it, the writer apparently not realising that the greatest permanent official a man has is his wife. Therefore, it was a pleasure to get away to Harrogate for the moment and to forget all about traffic commissioners. It was also good to be among municipal transport people knowing that at long last and after many years of educational work on the part of the Association, they had secured the passage through Parliament, if not of the actual Omnibus Bill itself, at any rate of the Omnibus Bill in substance incorporated as Part V of the Road Traffic Act. As the President had said, it was originally incorporated in the Road Traffic Bill, but the House of Lords did not see eye to eye with the House of Commons on that particular subject and Part V was struck out. Fortunately, however, Commander Kenworthy had been successful in the ballot and when he went to India his place was taken by Mr. Sturr and Mr. Arnott, the latter being a member of the Association, and so they had two strings to their bow and said to themselves that if their Lordships did not allow Part V they would go for the Omnibus Bill in exchange. In the end the Omnibus Bill was sent to the same Committee as the Road Traffic Bill and the Committee was authorised to amalgamate the two Bills. He himself had moved about four pages of amendments, converting the Omnibus Bill into Part V of the Road Traffic Bill, and thereupon their Lordships accepted it. The curious thing was that this part of the Road Traffic Bill, which was the most controversial part of the Bill, when it first came out, eventually gave no trouble whatever as the result of negotiations inside Parliament, and perhaps even more negotiations outside Parliament, and as a matter of fact, it was passed in about half an hour after mutually congratulatory speeches. That, said Mr. Morrison, was characteristically British, and his experience had been that if anyone wished to get something through Parliament that was fundamentally revolutionary, the best thing to do was to describe it in highly conservative language. In the same way, if a Conservative Minister had a strong Socialist opposition and wanted to get a highly Conservative Bill through, the best thing to do was to describe it in revolutionary language.

#### A Victory for Local Government.

Continuing, Mr. Morrison said: Part V of the Road Traffic Act incorporates all the essentials of the Omnibuses Bill and it can be regarded as a significant victory for the elemental rights of local self-government. Under the new order of things it will be possible for all local authorities operating transport undertakings of any kind to apply for licences to operate omnibuses in the same way as private operators. It has slowly dawned upon the public that the Road Traffic Act is not merely a measure for the police regulation of motor traffic—important as that would be—but a measure providing for the economic and efficient organisation of the great industry of road passenger transport. Part IV of the Act will enable the new Traffic Commissioners and the Ministry of Transport

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to systematise and co-ordinate time-tables, gradually to lift public service vehicles to a common high standard of safety and convenience, to co-ordinate public road service vehicles and other means of transport, and to eliminate wasteful competition while guaranteeing to the workpeople engaged in the industry reasonable conditions of labour. It is through measures of industrial reconstruction, such as the Road Traffic Act, that the economic salvation of the country will in the end be secured, and I am anxious that the public should realise the vast importance of this aspect of the new statute.

### Business Management in Municipal Transport.

He would point out that there was provision in Part V for healthy co-operation between various municipal transport undertakings, and indeed between them and private undertakings wherever it is in the public interest. If in the municipal transport world there still be local authorities with parish pump minds, he would beg of them to cure themselves of this affliction because in modern transport the parish mind is doomed. If the municipalities are to take their proper place in the provision of transport services, they must come together or they will be swamped by large-scale private enterprise. Moreover, the municipality in business must, as is increasingly the case, run its trading undertakings on the best commercial lines. The public Health Committee may be able to postpone a question for a month with no great disadvantage to the public service, though postponement should never be regarded as an easy way of evading pressing problems. For municipal trading undertakings, however, the standing orders and procedure of the local authorities and their committees must provide for rapid decisions, including those day-to-day decisions which are essential to vigorous business management.

The efficient general manager of a municipal transport undertaking must be made to feel that he is a business man first and a municipal officer afterwards, and short of committing the Council on questions of policy and finance, he, together with the chairman of the committee, must have the right to take urgent decisions subject to reporting thereafter to the Committee. If the manager is not efficient or cannot be trusted he should be removed. He (Mr. Morrison) had no room for the inefficients in public administration. It may not be too easy to remove inefficient councillors, and in some Governments—not the present one, of course—it is not easy to remove inefficient Ministers, but they had to make sure of removing inefficients in the public service, whether they be Governments or local authorities. They must not hesitate to remove officers who are clearly unfitted for the duties they are called upon to perform, but if they had a competent officer they must give him his head. Do not let him think he cannot move an inch without waiting a fortnight for the next meeting of his committee.

All this required the highest standard of commercial rectitude, both on the part of the chairmen of committees and of municipal officers, and the standing orders must be rigorous in their prevention of undue influence. No councillor or other man in public service should recommend particular people for positions in any department, and we should form at the beginning of our public lives the determination to stand firm against applications of this sort. He had often had applications from people recommending somebody, not because the person was specially fitted for the job, but because he has been out of work for a long time, and they were sorry for him. Such applications had come to him even whilst he had been Minister of Transport. His answer always was that the standing orders of the council or the rules of the Civil Service are such as to prohibit interference on the part of members or Ministers with appointments. Therefore, he could not do what was asked of him and, as a matter of fact, he would not if he could. We must uphold this position, because if municipal officers or Ministers of the State are saddled with subordinate people who are not suited for their jobs, it was not fair to the chief officer of the department who must be responsible for the efficiency of his department. I have never, Mr. Morrison continued, wanted to know the politics of a person applying in the proper way for a public position. I do not want to know, and as long as he can do his job efficiently I am not concerned. If, however, a person allows his politics to interfere with the job he is doing, then I should have a row with him. Whilst, however, he discharges his duty to the authority, with propriety and efficiency, his politics are a matter of indifference to me and should be in every case. But in some way or another, both as regards the State and the municipality, in business there must be provision for rapid action where rapid action is commercially necessary, and political influence must be avoided in the essentially commercial aspects of public business undertakings.

### Motor Coaches in Central London.

The Road Traffic Act, Mr. Morrison continued, will enable the Minister of Transport for the first time to take really big strides in securing order on the King's Highway. It will have to be recognised that when a vehicle occupies part of the highway, it is occupying a highly expensive piece of public capital. For example, new arterial roads with a 30-ft. carriageway often cost about £60,000 per mile. A motor coach will occupy one of the three tracks or lanes which a 30-ft. carriageway affords, i.e., one-third of the width. With ample clearance fore and aft, the motor coach in motion may occupy, say, 44 yards of carriageway in length; if you work it out you will find this space represents £500 of public capital, apart from capitalised cost of maintenance lighting, police control, etc. You may say that in this calculation I am charging against the motor coach the cost of tree planting and footway construction, but after all, the trees will add to the pleasure of the coach passengers, and at the beginning and end of their journey they will certainly use the footway. In the City of London where £120 per sq. ft. has been paid for widening a street, the bare space occupied by a stationary motor coach, say, 30 ft. by 10 ft. might be worth £36,000.

Mr. R. S. Pilcher.

*President, Municipal Tramways and Transport Association, 1930-31.*

Congestion, overcrowding, and lack of regulation, besides meaning danger to life is contrary to any reasonable standard of public economy, and we have to get this collective conception of public economy into the mind of the nation. In London, for example, a large number of motor coaches are now coming into the very centre of the congested area, and in London until the Road Traffic Act is in operation there will be no power to deal with the situation. The presence of a large number of big motor coaches in places like Central London is not to be recklessly tolerated, and it is desirable that all those concerned in the rushing of both motor coaches and omnibuses on to the roads in London and elsewhere should not assume that I shall tamely submit to accomplished facts when the Road Traffic Act comes into force. It is said that various people are trying to jump claims prior to the operation of Part IV of the new Act. Everybody had better know that the safety and order of our highways will make it essential for proper action to be taken when the new provisions come into force. This I made clear when the Road Traffic Act was read a third time, so that if people are "jumping claims," I hereby inform them that they are jumping at their own risk and must take the consequences when the Act comes into force.

In conclusion, Mr. Morrison said: I have been pleased to meet representatives of the Association during the year at the Ministry of Transport to exchange views. Your President has upheld your views and furthered your interests with that disinterestedness and

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energy which is characteristic of Presidents of this Association, and Mr. Beckett has been as clever as usual in handling a Government Department and doing what he can within the House of Commons. I am very glad that the Association is so representative, and I am very glad it is strong, because it is far better for Ministers to deal with united municipal associations than with individual local authorities. We cannot deal with individual local authorities, and, therefore, I preach trade unionism to the municipalities for the same reason that I preach it to the workmen, namely, that it is far better for everybody concerned to be able to deal with responsible associations and collective bodies than to try to deal with individuals, many of whom often get into each other's way. I am delighted to be with you; I congratulate you on the progress of the Association and the success which we have together been able to achieve in Parliament, and I hope the future of municipal transport may be greater and finer, and even more brilliant in the future than have been the great things which it has achieved up to the present time.

Alderman A. G. Ellaway.
*Vice-President, Municipal Tramways and Transport Association, 1930-31.*

**Alderman A. G. Ellaway** (Vice-President elect, Birmingham) proposed "The Mayor and Corporation of Harrogate."

**The Mayor of Harrogate** (Alderman Richard Annakin, J.P.) responded.

**Mr. J. Arnott, M.P.** (ex-Chairman, Leeds Corporation Transport Committee), proposing "The Municipal Tramways and Transport Association," said that on this occasion the members of the Association were celebrating a great victory for which they had already expressed their appreciation to the Minister of Transport and those who had helped things in the House of Commons and elsewhere. The work that had been done during the last few years, however, would have been impossible had not the municipalities been organised in a body such as the Municipal Tramways and Transport Association. The Minister of Transport had referred to the parish pump mind and to the fact that the work done by the Association was an antidote to the parish pump mind, which at one time perhaps was right enough. The work of the Association, however, had helped in a large measure to encourage local activity and the development of municipal transport services, which would never have been possible without the Association. Nevertheless, in order to make that work successful, it was necessary that the people engaged in municipal transport undertakings should have a high appreciation of their locality and should be determined to make the best of their locality. At the same time, whilst that local patriotism was undoubtedly a virtue up to a certain point, that point was reached when people determined to concentrate on their own areas and disregard what was going on around them in other areas. Experience had shown how impossible it is to obtain efficiency in any direction without co-ordination and organisation, and the work of the Association together with recent events had demonstrated how, whilst endeavouring to preserve local initiative and local organisation, it was also necessary to take a broader and national view so that the interests of a larger community can best be served. By co-ordination among the various transport authorities over a wide area, it was possible to make the individual local transport systems more efficient because transport was much less satisfactory when confined to an individual small locality. Indeed "Local transport" was rather a contradictory term. Transport must be as far as practicable world wide, and it was more difficult to create an efficient transport service with local management than in any other work carried on by local authorities. It had, therefore, been one of the functions of the Association to link together the various transport authorities of the country and get a national co-ordination, and it might almost be said, an international co-operation. The Association had been very successful in doing that, but it had another function equally important. It was possible to get a mass movement by means of an Association that could not be obtained in any other way, and that had been demonstrated very clearly in what had happened in connection with the Association's Omnibus Bill, and the Road Traffic Bill, in which the Minister of Transport had taken such a keen interest and for which they had already expressed their appreciation. It was true that very often a collective opinion expressed through an association was not the same as some individual opinions, but the educational force and the work carried out by an association such as the Municipal Tramways and Transport Association had carried matters much farther than they could ever have been by individual action. As he had said at the morning meeting, however, he did not regard the Road Traffic Bill as the end of things, but rather the beginning, and he looked forward to larger organised transport than ever before, in which the Association would play an equally important part to that which it had played in connection with the Road Traffic Bill. It was because he believed the Association could play a still greater part in the development of transport in the country that he had the greatest pleasure in proposing the toast.

**Mr. R. S. Pilcher** (President elect), responding to the toast, acknowledged the great assistance which Mr. Arnott had been in Parliament in connection with the Omnibus Bill, and at the same time, expressed thanks to the Association of Municipal Corporations for the great assistance which that body had given in connection with the Omnibus Bill. It was, he said, a very pleasing state of affairs that associations like these were able to work together in complete harmony for the common good. As regards the Harrogate Conference, Mr. Pilcher said he believed it was a record attendance, for there were 98 authorities represented out of the 103 who were members. The very inspiring speech of the Minister of Transport had laid down the sound principles upon which local government should be conducted, and it was a model speech on that subject. The Association, moreover, was indebted to the Minister for the manner in which he consulted representative bodies and organisations on important matters affecting their particular interests. He was not aware that it had ever been done to such an extent in the past, but he was quite sure that both the Minister and the parties concerned had benefited by that policy. The Minister of Transport, he continued, had a knack of making everybody think that they were very important and that they were getting all they wanted, but as an Association they knew they had not got all they wanted and they accepted the Road Traffic Bill as an instalment. The importance of the municipal transport service of the country was exemplified in the fact that there are £86,000,000 invested in them, and they employ nearly 100,000. As a matter of fact, he believed the transport employees are a key industry so far as the labour is concerned, because the transport worker came into touch with all other workers; he carried them to their work in the morning and brought them back home at night, and it might be said perhaps without exaggeration that peace in the transport world might have a great deal to do with peace in the country as a whole. It was satisfactory to know that in the transport world there had been no industrial trouble since the general strike, and it was to be hoped that these peaceful conditions would continue. Mr. Pilcher, continuing, referred to the work which the General Secretary, Mr. Beckett and his staff did for the Association, and particularly to the work which Mr. Beckett had done in connection with the Omnibus Bill. It was quite true, as the Minister of Transport had said, that Mr. Beckett knew how to get an interview with the

*(Continued on page 232).*

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**Delegates and Guests** at the Municipal Tramways and Transport Association Conference at Harrogate.

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Minister himself, and he would like to place on record that the Council of the Association appreciated the work that was being done in the secretarial office. As to the future, there were many problems which the Association had to face and there was never a more difficult time in the transport world, and never a greater transition taking place than at the present time. Nevertheless, he felt certain that the Municipal Tramways and Transport Association would overcome all these difficulties and would, as the Minister of Transport suggested, work for the good of the country and the peace of the industry. Finally, Mr. Pilcher referred to the presence at the Conference and the dinner of M. de Lancker and M. de Becker, President and Secretary respectively of the International Union of Tramways. Their presence was very much appreciated and he asked them to convey to their colleagues on the Continent the greetings and good wishes of the Municipal Tramways and Transport Association. He believed, he said, that quite apart from transport, the coming together of representatives of such organisations could only result in international goodwill and peace, and the more such meetings there were the better it would be in all interests.

**M. de Lancker** called upon to speak, expressed his appreciation of the manner in which he and M. de Becker had been received in this country, and said how interesting he had found the discussions at the Conference.

The final toast was that of "The President," proposed by Alderman J. G. Storey (Wallasey), and responded to in a few words by the President.

## HISTORY OF THE GENERAL ELECTRIC COMPANY.

THE LIFE WORK OF SIR HUGO HIRST.

In choosing the title "Forty Years of Electrical Progress"* for his volume on the history of the General Electrical Co., Ltd., Mr. Adam Gowans Whyte, B.Sc., acted wisely. For to a very great extent the two subjects are identical, and Sir Hugo Hirst has been a leading figure since 1886 in making electrical invention available as a commercial product. The work of the G.E.C. has been of benefit to the Empire in more ways than one. Britain would have been in a sorry plight on the outbreak of the European War if the G.E.C. had not given attention to the manufacture of carbons for arc lamps. Many of the other products of the company, too, were required directly or indirectly for military purposes. In the autumn of 1914 the future of the carbon works had reached a critical stage in consequence of the tendency of the country to sacrifice home industries to secure cheap foreign goods.

In July, 1914, Mr. Hugo Hirst happened to visit Germany, and so much impressed was he by the grave state of affairs in Europe that on his return he consulted the Admiralty with a view to making arrangements for maintaining a supply of carbons sufficient at least for naval needs. Before these negotiations reached a conclusion, the outcome was decided by the declaration of war. Whereas the combined War Office and Admiralty demand for searchlight carbons before the war had been at the rate of 150,000 pieces per annum, the output was on an average of over 1,000,000 per annum through the war period.

In 1914 the thermionic valve, now a commonplace article for radio sets, was a scientific novelty. Towards the end of 1916, when the British naval, military and air force authorities needed large supplies of valves there was no British source available, but the G.E.C. was able to meet the need.

It was in 1889 that the small electrical warehouse in which Mr. Hirst had joined Mr. G. Byng became known as the General Electric Co., Ltd. From a supplies house the company has developed, on a set plan of Mr. Hirst, its founder, into manufacturers in every branch of electrical engineering.

After the war Sir Hugo Hirst (who did not receive his baronetcy until 1925) and his numerous co-adjutators set themselves to advance the use of electricity for the reconstruction of industry. This task has been facilitated by the Electricity Supply Act of 1926 and the formation of the Central Electricity Board. The G.E.C. has kept in advance of the latest demands. On the power production side it has constructed turbo-alternator sets up to 50,000 kilowatts, and on the transmission side switchgear capable of controlling circuits up to 132,000 volts has been developed.

In railway electrification, including the provision of electric locomotives and cars and signalling equipment, the company has been prominent in several countries. Equally comprehensive arrangements have been made for supplying industrial and domestic needs. The G.E.C. in the new electrical field of broadcasting has been a pioneer. Research and experiment are continuous in the numerous works and at the laboratory at Wembley, thus enabling the company to give industry a lead. In these circumstances it is not surprising that the employees now number more than 26,000, and that in the last twelve months when staff reductions have been common elsewhere, the G.E.C. employees have increased by 3,000.

* Published by Ernest Benn, Ltd. Five shillings.

## BRIGHTON MAIN LINE ELECTRIFICATION

IMPORTANT ORDER FOR TRAIN EQUIPMENTS.

The Southern Railway has placed with the Metropolitan-Vickers Electrical Co. an order for electric railway equipment which is one of the most important of recent years. The order covers the supply of complete electrical equipments, including the necessary motors, control gear, lighting, heating, and compressor apparatus, for 104 motor coaches and 104 trailer coaches.

The greater part of the apparatus is for the new rolling stock to be used on the forthcoming electrified service to Brighton. The apparatus for this service comprises electrical equipments for forty 4-coach train units, each unit consisting of two motor coaches and two trailer coaches. The remainder of the apparatus is for general extension to the rolling stock of the electrified system, and comprises electrical equipments for twelve 3-coach train units and six 2-coach trailer units. The 3-coach train units each consist of two motor coaches with a trailer coach between.

The new equipment will be similar to that which has been supplied by the Metropolitan-Vickers Electrical Co. on previous contracts. Each motor coach will be equipped with two 275 H.P. motors of the totally-enclosed self-ventilated type. The motors, which are of the largest size used for motor coach service in this country, are arranged in pairs on the bogies underneath the driving compartments at the two ends of the train unit. The control gear will be of the Metropolitan-Vickers all-electric type with automatic acceleration.

With regard to the heating equipment, an interesting and novel feature of the equipments for the Brighton service will be the provision of electric water heating for the lavatory compartments. The power for this purpose will be taken from the 600-volt main, and each heater will be controlled by a contactor which is automatically operated when the water-tap is turned on or off so that the heater is only in circuit when the supply of hot water is required.

The present contract is the sixth of considerable magnitude which has been placed with the Metropolitan-Vickers Electrical Co. for train equipments for the Southern Railway. It will bring the total of Metrovick-equipped stock on the system to 668 motor coaches and 864 trailer coaches. A feature of interest in connection with the existing equipment is that the maintenance cost incurred has been remarkably low, probably the lowest of any railway in the world.

The value of the present contract amounts to rather more than £250,000.

## TRAMWAY AND LIGHT RAILWAY NOTES.

### ABERDEEN.

TRAMWAY WORKERS' WAGES.

The Tramways Committee has decided to review the scale of wages in all departments before voting on an application from the fitters and turners for an increase from £2 19s. 9d. to £3 10s. per week. Councillor James George, chairman of the Committee, states that in Aberdeen the men are paid slightly more than in other places.

### BELFAST.

NEW TRAMWAYS COMMITTEE.

At a special September meeting of Belfast Corporation the following members were appointed as the Tramways Committee:—Chairman, Councillor J. D. McClure; vice-chairman, Councillor R. J. R. Harcourt; members: Alderman J. A. Doran, Councillors Lambe, Chambers, McCoubrey, J. Maguire, George Gray, A. McBride, Sweeney, J. Malcolm, Boyle, Noble, F. J. Holland and H. McKibbin.

### COVENTRY.

LONGER FARE STAGES.

The stages on the Coventry Corporation tramcar and omnibus routes have been lengthened by approximately one-third, as from September 7. The effect will be a reduction on the 1½d. and 2d. fares, reductions being already made on longer journeys.

### DUBLIN.

TRACK ALTERATIONS ON O'CONNELL BRIDGE.

The City Commissioners have decided on improvements in a number of streets, and to repair O'Connell Bridge. The tramway tracks on the bridge will be altered to facilitate traffic at an estimated cost of £10,000. The Tramways Company have agreed to the arrangement, providing the cost does not fall upon them, although they would prefer that the rails should remain as at present. Work has begun in removing the double set of tramway lines across O'Connell Bridge. They will be replaced by single track laid within three feet of the island on each side, to facilitate the flow of traffic.

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### DUNDEE.

ACCIDENT CLAIMS.

As a sequel to an accident at Dundee last April, when a tramcar was ran into by another which was following, claims amounting to over £8,000 have been made against the Corporation. One man who had his feet amputated claimed £3,000, but is willing to settle for £1,500 plus expenses, leaving it to the goodwill of the Council to find him employment. Another man who had his right foot amputated claimed £5,000, but is willing to settle for £2,000 without employment, or £750 if he is given a job. The case of a third man who had his toes injured had been settled by the Town Clerk for £175. These facts were considered at a meeting of the Transport Committee, when the legal representative of the insurance company said he would report and let the Committee know the decision.

### GLASGOW.

RECONDITIONED CARS.

At present reconditioned tramcars are being turned out of the Corporation's departmental workshops at the rate of five per week. All the cars are now electrically heated.

### HULL.

TRACK ACROSS NEW BRIDGE

The Tramways Committee has decided to lay tramway track over the new North Bridge to connect with the service on the other side. The cost will be £10,000, the rails being £5,000 and cables, subways, etc., £5,000. The question of running tramcars over the proposed new Monument Bridge was also discussed, and it was decided to submit the general manager's plan for the views of the other committees concerned.

### KIRKCALDY.

TRAMWAYS TO BE DISCONTINUED.

The Town Council has decided to discontinue the tramways, and has asked the Transport and Electricity Committee to recommend the best method of replacing the system, wholly or partially, by another system of transport. The report is to be prepared for submission to the Town Council in December. The tramways comprise 8½ miles of track, and the car mileage for the past year amounted to 480,895. Passengers numbered 4,437,895. The total revenue was £24,347, working expenses £27,408. After paying interest and sinking fund charges, there was a net deficit of £8,631.

### LEEDS.

NEW TRAMWAY ROAD MATERIAL.

A new road material, which is said to be practically indestructible, non-skidding, and almost noiseless, is being used by the Tramways Department. It has already been tested for eighteen months, and is now being laid on a mile of track in Dewsbury Road. Its basis is silica and bitumen, and the department believe it is the ideal material for surfacing that part of the road for which they are responsible. Mr. R. L. Horsfield, general manager of the tramways, says that being laid cold it is ready for traffic in a few hours, and it can be laid in all weathers.

### LLANELLY.

MUNICIPALISATION PROPOSAL.

A special meeting of the Corporation is to consider a proposal that the Council shall acquire the undertaking of Llanelly Electric Supply and Traction Company. The company recently obtained powers to convert the tramways into a trolleybus undertaking, and to extend the routes. A deputation from the Corporation and their expert adviser have met representatives of the company, and arrived at a tentative agreement.

### LOWESTOFT.

TRAMWAYS NOT TO BE ABANDONED.

Councillor A. Evans, Chairman of the Tramways Committee, states that the rumour that the Council propose to abandon the tramways at the end of the year is wrong. They are taking advantage of the offer by the Unemployment Grants Committee of an increased grant for the removal of the disused tramway track, the Council having already decided to remove this track within the next five years.

### OLDHAM.

CURRENT METERS FOR CARS.

The general manager of the Corporation Tramways having reported further on the question of fitting traction current meters to tramcars, and given particulars of consumption on a few cars to which meters had been fitted, it was decided that meters be fitted on all cars when brought in for periodical overhaul.

### SOUTHEND.

LOWER FARES WANTED—PROPOSED JOINT COMMITTEE WITH OMNIBUS COMPANIES.

The ratepayers have asked the Town Council to introduce more penny fare stages on the tramways, and to allow children to travel at half-rate. A report on the matter is being prepared by the general manager. In reply to a suggestion that a joint committee should be formed of the omnibus companies and the Tramways Committee, Councillor O. H. Cockrill states that discussions have taken place.

## PERSONAL.

**Mr. J. P. Savage** has been appointed publicity manager to the Birmingham and Midland Omnibus Co.

**Mr. W. B. Jones,** chairman of the United Steel Companies, has been appointed a director of the Yorkshire Electric Power Co.

**Councillor Irvine Smith,** chairman of Bradford Tramways Committee, owing to the demands of his business, has decided not to seek re-election to the City Council.

**Colonel J. B. Neilson, C.M.G., D.S.O., C.A.,** has been appointed to a seat on the board of Vickers-Armstrong, Ltd., to fill the vacancy caused by the death of Mr. G. G. Sim.

**Sir Felix J. C. Pole,** formerly general manager of the Great Western Railway Co., will, it is understood, visit the Sudan in December to inspect certain railways.

**Alderman Robert Mell,** chairman of Hull Tramways Committee, was on September 25 chosen as Lord Mayor of the city. There were no other nominations. Alderman Mell is a railway supervisor and a socialist.

**Mr. Eric Mitford,** who has been assistant engineer of Gateshead Tramways for several years, sailed in September for Hong Kong, to take up an appointment as assistant engineer with the Hong Kong Tramways.

**Mr. C. W. Jackson,** borough electrical engineer, King's Lynn, was lately appointed engineer and general manager of the Great Yarmouth Corporation Electricity Department at a salary of £950 per annum. Subsequently he withdrew, and the vacancy was again advertised.

**Mr. J. Harcourt Williams,** manager of the Manchester branch of the British Thomson-Houston Co., Ltd., has been appointed to succeed Mr. A. L. Lunn as deputy-chief engineer of Manchester Electricity Department.

**Mr. H. Moxon,** who has been with Leeds Tramways Department for thirty years, including the past eleven years as deputy-accountant, has been appointed chief accountant, in succession to the late Mr. J. W. Blakeborough.

**Mr. H. Voyce,** who for the past five years has been the A.E.C. sales and service area manager for Yorkshire, has joined the firm of Oswald Tillotson (1929), Ltd., the new A.E.C. northern distributors, as sales representative for the county.

**Councillor W. E. Turner,** chairman of Bury Corporation Tramways Committee, and vice-chairman of the Lancashire and Cheshire Association of Municipal Tramways, is to be the next Mayor of Bury. He is a retired railway official.

**Mr. J. Smith Green,** a driver in the employ of the London General Omnibus Co., has been presented with a silver wrist watch by the St. John's Wood Division, Metropolitan Police, in acknowledgment of assistance rendered to a constable against a hostile crowd.

**Major T. H. Vitty, A.M.I.E.E.,** who for ten years has been chief of the Engineering Department, Metropolitan Police, has resigned. Major Vitty introduced several devices to counteract motor bandits, and equipped the cars of the Flying Squad with wireless receiving sets.

**Mr. Victor Watlington** has resigned his appointment as managing director of the English Electric Co., Ltd., but retains his seat on the board. **Mr. G. H. Nelson, M.I.E.E.,** of the Metropolitan-Vickers Electrical Co., Ltd., who has joined the board, has been appointed managing director.

**Mr. P. J. Robinson,** city electrical engineer of Liverpool, has been presented with a canteen of cutlery by the staff of the Electric Supply Department in recognition of his silver wedding. Councillor F. C. Wilson, chairman of the Tramways, Electric Power and Lighting Committee, made the presentation.

**Mr. F. B. Clapp,** who was associated with the electrification of the Melbourne suburban railways, and afterwards with the Vacuum Oil Co., has been appointed managing director of the Australian General Electric Company. He succeeds Mr. A. Maughan who had been with the company for over twenty-three years.

**Mr. G. W. Briggs,** superintendent of power stations to the Newcastle-on-Tyne Electric Supply Co., has retired after 41 years' service with the company. He has been presented with a cheque and clock by the directors, an all-mains radio receiver by the staff, and an inlaid cigar cabinet by Messrs. Merz and McLellan.

**Mr. Herbert Morrison,** Minister of Transport, has appointed Mr. Aubrey Clark to be his private secretary in the place of Mr. G. F. Stedman, who has been promoted; and **Lord Ponsonby,** Parliamentary Secretary to the Ministry of Transport, has appointed Mr. S. S. Wilson to be his private secretary in place of Mr. Aubrey Clark.

**Mr. Charles Sprowson** has resigned his position as traffic superintendent of Stockport Corporation Tramways after 29 years' service. His colleagues have presented him with a gold albert,

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a wallet of notes, and a pipe, the presentation being made by Mr. A. T. Eardley, the manager. He is succeeded by Mr. C. F. Wolsey.

**Mr. Frank Pick,** managing director of the London Underground Railways and their associated tramway and omnibus companies, has been appointed by the Minister of Health as one of the members of the Departmental Committee which is to inquire into the qualifications, recruitment, training and promotion of Local Government officers.

**Mr. L. C. F. Bellamy,** general manager of the Hong Kong Tramways Company, and Mrs. Bellamy, left Liverpool on October 10, by the "Duchess of Atholl" for Hong Kong (via Canada and Japan). Mr. Bellamy has recently been elected vice-president of the Hong Kong Automobile Association, and has also been made a Justice of the Peace.

**Mr. R. W. Biles** has been appointed technical assistant to Mr. J. W. Beauchamp, engineer for the Central Electricity Board's South-West England and South Wales scheme. Mr. Biles has invented a number of protective gear devices, including the diverter relay system, and since August, 1927, he has been with the North Metropolitan Electric Power Supply Co.

**Mr. E. Seddon,** engineer and manager of Edinburgh Corporation Electricity Department, has been elected chairman of the Scottish Centre of the Institution of Electrical Engineers. Mr. Seddon started his career in the Blackpool Tramways and Electricity Departments, and he has served with the Hanley, Eastbourne and West Ham municipal electricity undertakings.

**Mr. P. G. Campling,** late general manager and electrical engineer of the Great Yarmouth Electricity and Transport Departments, has been asked to act as consulting engineer, at a fee of 100 guineas, until his successor takes up his duties. As previously recorded in these columns, Mr. Campling has been appointed district engineer in East England under the East England electricity scheme.

**Coventry Chain Company.**—Mr. Arthur Brampton, chairman, and Mr. F. W. Fell Clark and Mr. Norman Hill have resigned from the Board of the Coventry Chain Company. Mr. Charles W. Goff has been appointed chairman, and he has also been elected a director of Hans Renold, Ltd. Mr. Charles G. Renold, chairman of Hans Renold, Ltd., has been appointed a director of the Coventry Chain Company.

**Mr. C. W. Challenger,** a director of the Bristol Tramways and Carriage Co., Ltd., who celebrated his 78th birthday on September 19, conducted the first Bristol tramcar (horse-drawn) in 1875, when his passengers included the late Sir George White, Bart., the Mayor, and members of the City Council. Mr. Challenger was for some time manager of Neath and District Tramways Co., and of Gloucester Tramways Co. He was made traffic manager at Bristol in 1882, retiring in 1919, when he became a director.

**Mr. A. L. Lunn,** late deputy-chief engineer, Manchester Corporation Electricity Department, has entered upon his appointment with the Underground Railways Group of London. The position is a new one, and the duties relate to the generation, distribution, and future development of power for the companies. Before he left Manchester Mr. Lunn was presented with a mahogany desk and some glassware by the staff of the electricity department. Mr. H. C. Lamb, the electrical engineer and manager, in making the presentation, said they were sorry to lose Mr. Lunn, whose qualities as an engineer and executive officer they valued highly.

**Mr. H. A. Blackburn,** general manager and engineer of Keighley Corporation Transport, has been appointed manager of Great Yarmouth Corporation Transport Department at a commencing salary of £550 per annum. There were 82 applicants, and four were selected for interview. These were, in addition to Mr. Blackburn, Mr. M. J. Somerfield, assistant manager, Walsall Corporation Tramways and Omnibuses; Mr. W. H. Worton, engineer, Bristol Tramways and Carriage Company; and Mr. C. E. Crossley, deputy engineer and manager, Chesterfield Corporation Transport Department. Mr. Blackburn, who is the son of Mr. A. A. Blackburn, general manager and engineer, Huddersfield Corporation Tramways and Omnibuses, served an engineering apprenticeship with Workman & Clarke, shipbuilders, Belfast, and was afterwards with the British Westinghouse Co. at Manchester. During the war he served as engineer officer in the Royal Naval Air Service. After the war he resumed his former position with the Metropolitan-Vickers Electrical Co., Trafford Park, as a technical engineer in their commercial department. In 1922 he was appointed rolling stock superintendent to Plymouth Transport Department, resigning in 1926 to join Karrier Motors, Ltd., at Huddersfield, as technical assistant. He was appointed general manager and engineer to the Keighley Corporation Tramways early in 1929.

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## CONTRACTS AND ORDERS.

**Leicester Tramways Committee** has accepted the tender of Hadfields, Ltd., for special trackwork.

**Forest City Electric Co., Ltd.,** of Manchester, has a contract to supply traffic light signals to Stretford Council.

**Leeds Tramways Committee** has accepted the tender of the British Insulated Cables, Ltd., for the supply of three miles of trolley wire at 9½d. per lb.

**Islington Cleansing Committee** has accepted the tender of the Edison Swan Electric Co., Ltd., for the supply of a battery for an Orwell electric vehicle.

**Bristol Tramways and Carriage Co., Ltd.,** have purchased two miles of 'Phono electric trolley wire from the Equipment and Engineering Co., Ltd.

**Siemens Electric Lamps and Supplies, Ltd.,** have a contract from the G.P.O. for a twelve months' supply of Siemens gas-filled, vacuum and special lamps.

**Bombay Electric Supply and Tramways Co.** have placed an order with the Equipment and Engineering Co., Ltd., for a "TA" type electro-magnetic crack detector.

**The Egyptian State Railways** have accepted the tender of the Westinghouse Brake & Saxby Signal Co., Ltd., for turnover levers and signalling materials, at a cost of £523.

**The Southern Railway** has placed contracts with Siemen's Electric Lamps and Supplies, Ltd., and the Metropolitan-Vickers Electrical Co., Ltd., for 12 months' supply of electric lamps.

**Buenos Aires Great Southern Railway Co.** has ordered three Diesel mobile electric power plants and a Diesel electric locomotive from Sir W. G. Armstrong Whitworth & Co. (Engineers), Ltd., Newcastle.

**The Victorian Electricity Commission** has placed contracts with the British Insulated Cables, Ltd., for the supply of three-core cable and with the Metropolitan-Vickers Electrical Co., Ltd., for metal-clad switchgear and accessories.

**Ilford Tramways Committee** has accepted the tender of Messrs. Johnson & Nephew for copper wire at 9⅝d. per lb. Owing to the phenomenal drop in the price of raw copper, this price is stated to be 3 $\frac{9}{16}$d. per lb. less than was paid in January.

**Johannesburg Council** has placed contracts as follow: Wade and Dorman, 800 tons of grooved tramway rails £15,000, 2,500 pairs of grooved rail fishplates and two tons of fishbolts; H. Alers Hankey 2,500 tiebars. All the material is to be of British manufacture.

**The General Electric Co., London,** in competition with eighteen manufacturers in various countries, have been awarded the following contracts by Johannesburg Council: 1,000 10-amp. and 800 20-amp. electricity meters, made by Chamberlain & Hookham, an associated company.

**Lamplugh Spring Seats, Ltd.,** New Oxford House, Hart Street, W.C.1, have a further order for 25 sets of seats for tramcars from Birmingham Corporation. This makes the fifth order received from Birmingham Corporation, which now has about 400 tramcars equipped with Lamplugh seats.

**Glasgow Transport Committee** has accepted the following tenders: Edgar Allen & Co., Ltd., and the Titan Trackwork Co., Ltd., for special work points and crossings; Shaw (Glasgow), Ltd., for cast-iron pipes; Mr. J. M. Dempster, for a brake drum turning lathe; Stewart & Houston, for a crankshaft grinding machine; Mansons, Ltd., and S. F. Bowser & Co. for petrol pumps for the Larkfield garage extension.

## B.T.H. EQUIPMENT FOR LONDON RAILWAYS.

Control equipment numbering 160 for new motor and trailer cars of the London Electric Railways are to be supplied by the British Thomson-Houston Co., Ltd., Rugby. It will be remembered that in January, 1928, this company received the order for 561 control equipments for the motor and trailer coaches constructed under Lord Ashfield's scheme for speeding up and increasing the travelling facilities on the London Underground Railways. All the latest improvements are embodied in the design of the new equipments, which include circuit breakers, reversers, master controllers, cut-out switches, contactor control gear, relays, switchboards, etc.

## PICCADILLY TUBE EXTENSION.

Work has been started on the first contract, involving nearly £180,000, placed in connection with the Underground Company's £3,000,000 scheme for extending the Piccadilly Tube from Hammersmith to Northfields. Balfour, Beatty, Ltd., have been given the contract, which is for the Hammersmith to Ravenscroft Park section. With the extension from Finsbury Park to Cockfosters, work will be found for about 20,000 men.

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# TRAFFIC RETURNS.

## Tramway and Omnibus Undertakings in the United Kingdom.

| NAME OF COMPANY OR CORPORATION | 1929. WEEKS ENDING | | | | | 1930. WEEKS ENDING | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sept. 7 | Sept. 14 | Sept. 21 | Sept. 28 | Oct. 5 | Sept. 6 | Sept. 13 | Sept. 20 | Sept. 27 | Oct. 4 | Wks. | 1930 | Increase or Decrease |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Aberdeen Corporation ... ... ... | 5,264 | 4,831 | 4,697 | 4,924 | 4,427 | 5,081 | 4,890 | 4,940 | 5,095 | 4,960 | 18½ | 103,978 | + 1,763 |
| Ashton-under-Lyne Corporation... ... | 1,621 | 1,660 | 1,636 | 1,770 | 1,702 | 1,572 | 1,555 | 1,590 | 1,637 | 1,589 | 27 | 43,569 | — 2,201 |
| Ayr Corporation ... ... ... ... | 580 | 666 | 1,321 | 538 | 592 | 551 | 586 | 1,195 | 544 | 546 | 20 | 14,070 | — 1,139 |
| Barrow Corporation ... ... ... | 1,116 | 1,108 | 1,035 | 999 | 1,015 | 1,058 | 969 | 992 | 936 | 961 | 27 | 27,354 | — 607 |
| Belfast City ... ... ... ... | 12,529 | 12,685 | 12,412 | 12,152 | 12,717 | 12,970 | 12,932 | 13,237 | 12,832 | 12,917 | 26¾ | 341,028 | + 16,375 |
| Birkenhead Corporation ... ... ... | 5,313 | 5,201 | 4,928 | 5,022 | 4,901 | 5,489 | 5,463 | 5,379 | 6,230 | 5,302 | 27 | 143,793 | — 5,346 |
| Birmingham Corporation ... ... ... | 41,654 | 42,186 | 41,417 | 42,917 | ... | 41,279 | 41,467 | 42,439 | 42,980 | ... | 26 | 1,096,050 | + 38,599 |
| Blackburn Corporation ... ... ... | 1,976 | 2,184 | 2,208 | 1,860 | 1,978 | 2,217 | 2,220 | 2,218 | 2,073 | 2,024 | 26¾ | 56,813 | + 3,970 |
| Bradford Corporation ... ... ... | 14,820 | 15,416 | 14,764 | 14,842 | 15,113 | 14,153 | 14,373 | 14,306 | 14,495 | 14,625 | 27 | 383,676 | — 16,548 |
| Brighton Corporation ... ... ... | 3,368 | 3,151 | 2,865 | 2,802 | 2,547 | 3,314 | 2,958 | 2,808 | 2,860 | 2,568 | 26¾ | 79,008 | + 2,016 |
| Burnley Corporation ... ... ... | 4,057 | 3,865 | 3,483 | 3,613 | 3,871 | 3,442 | 3,477 | 3,222 | 3,356 | 3,503 | ... | ... | ... |
| Burton-on-Trent Corporation ... ... | 838 | 783 | 818 | 810 | 971 | 850 | 858 | 905 | 858 | 895 | 26 | 22,952 | + 766 |
| Bury Corporation ... ... ... ... | 2,715 | 2,626 | 2,638 | 2,748 | 2,627 | 3,153 | 3,012 | 3,136 | 2,982 | 3,077 | 26½ | 79,571 | + 11,859 |
| Cardiff Corporation ... ... ... | 8,173 | 7,944 | 7,916 | 7,669 | 7,947 | 7,755 | 7,732 | 7,875 | 7,736 | 7,959 | 26½ | 210,118 | + 1,570 |
| Chatham and District ... ... ... | 1,451 | 1,419 | 1,374 | ... | ... | 1,372 | 1,280 | 1,188 | ... | ... | 37 | 43,465 | + 236 |
| Chester Corporation ... ... ... | 444 | 426 | 430 | 435 | 435 | 693 | 674 | 681 | 676 | 694 | 27 | 18,110 | + 6,071 |
| Chesterfield Corporation ... ... ... | 2,234 | 1,983 | 1,929 | 2,075 | 2,115 | 2,212 | 1,941 | 1,985 | 1,998 | 2,139 | 27 | 52,191 | + 1,038 |
| Colchester Corporation ... ... ... | 572 | 583 | 564 | 602 | 548 | 612 | 622 | 614 | 620 | 620 | 28 | 17,261 | + 1,777 |
| Colne Corporation... ... ... ... | 911 | 700 | 674 | 670 | 730 | 788 | 661 | 647 | 636 | 700 | 27 | 19,312 | — 463 |
| Coventry Corporation ... ... ... | 3,705 | 3,693 | 3,682 | 3,770 | 3,831 | 3,404 | 3,487 | 3,650 | 3,612 | 3,739 | 27 | 101,644 | + 1,627 |
| Darlington Corporation ... ... ... | 1,031 | 990 | 1,004 | 1,004 | 1,064 | 1,071 | 1,069 | 1,047 | 1,128 | 1,062 | 26½ | 28,565 | + 2,307 |
| Derby Corporation ... ... ... | 3,476 | 3,404 | 3,315 | 3,392 | 3,505 | 3,363 | 3,300 | 3,430 | 3,393 | 3,443 | 27 | 90,735 | + 2,961 |
| Dover Corporation... ... ... ... | 524 | 504 | 452 | 450 | 417 | 528 | 492 | 463 | 461 | 438 | 27 | 12,231 | + 376 |
| Dundee City ... ... ... ... | 3,753 | 3,589 | 3,558 | 3,496 | 3,558 | 4,004 | 3,699 | 3,704 | 3,787 | 3,652 | 19½ | 72,967 | + 3,756 |
| East Ham Corporation ... ... ... | 2,351 | 2,365 | 2,337 | 2,397 | 2,464 | 2,285 | 2,302 | 2,385 | 2,374 | 2,381 | 26½ | 61,800 | + 666 |
| Edinburgh Corporation ... ... ... | 17,897 | 17,558 | 17,408 | 17,425 | 19,315 | 18,367 | 16,909 | 17,912 | 17,793 | 19,208 | 20½ | 385,074 | + 11,486 |
| Exeter Corporation ... ... ... | 1,128 | 1,122 | 1,088 | 1,100 | 1,080 | 1,200 | 1,215 | 1,194 | 1,184 | 1,201 | 28 | 31,816 | + 3,128 |
| Glasgow Corporation ... ... ... | 51,472 | 51,852 | 51,712 | 51,284 | ... | 54,787 | 53,517 | 55,254 | 53,871 | ... | 17 | 875,366 | + 53,659 |
| Gloucester Corporation ... ... ... | 596 | 588 | 626 | 652 | 779 | 774 | 711 | 735 | 735 | 812 | 26¾ | 19,010 | + 3,817 |
| Grimsby Corporation ... ... ... | 1,654 | 1,536 | 1,528 | 1,474 | 1,520 | 1,726 | 1,756 | 1,609 | 1,630 | 1,612 | 27 | 43,555 | + 4,509 |
| Halifax Corporation ... ... ... | 5,055 | 4,745 | 4,633 | 4,847 | 4,572 | 5,246 | 5,091 | 5,151 | 5,076 | 5,253 | 27½ | 141,152 | + 15,315 |
| Huddersfield Corporation... ... ... | 6,667 | 6,815 | 6,556 | 6,521 | 6,497 | 6,559 | 6,385 | 6,510 | 6,589 | 6,514 | 27 | 172,559 | — 2,028 |
| Hull Corporation ... ... ... ... | 7,266 | 7,237 | 7,371 | 7,368 | 7,882 | 7,289 | 7,317 | 7,472 | 7,460 | 7,649 | 27 | 195,694 | + 2,341 |
| Ilford Corporation... ... ... ... | 1,482 | 1,551 | 1,625 | 1,526 | 1,572 | 1,482 | 1,499 | 1,538 | 1,557 | 1,568 | 26½ | 40,588 | + 212 |
| Ipswich Corporation Trolley Buses ... | 1,375 | 1,317 | 1,334 | 1,352 | 1,344 | 1,391 | 1,376 | 1,412 | 1,451 | 1,396 | 26¾ | 36,764 | + 1,980 |
| Isle of Thanet ... ... ... ... | 2,246 | 2,047 | 1,537 | 1,067 | 821 | 2,009 | 1,758 | 1,229 | 900 | 649 | 39½ | 36,013 | — 4,400 |
| Kilmarnock Corporation ... ... ... | 475 | 465 | 494 | 465 | 525 | 495 | 515 | 504 | 508 | 505 | 20½ | 10,036 | + 407 |
| Leeds Corporation... ... ... ... | 20,184 | 20,195 | 20,191 | 20,266 | 19,906 | 19,813 | 19,706 | 19,949 | 20,281 | 20,286 | 26¾ | 535,641 | + 8,540 |
| Leicester Corporation ... ... ... | 8,647 | 8,665 | 8,733 | 8,753 | 8,794 | 8,334 | 8,482 | 8,793 | 8,589 | 8,656 | 27 | 224,818 | + 170 |
| Lincoln Corporation Buses ... ... | 1,024 | 966 | ... | ... | ... | 1,017 | 1,002 | ... | ... | ... | 24 | 22,768 | + 76 |
| Liverpool Corporation ... ... ... | 30,496 | 31,236 | 30,239 | 30,126 | 30,664 | 30,580 | 30,182 | 31,749 | 29,912 | 30,236 | 26½ | 809,315 | + 739 |
| London County Council ... ... ... | 82,467 | 82,974 | 83,164 | 83,586 | 85,969 | 80,475 | 81,579 | 81,858 | 82,696 | 84,643 | 26¾ | 2,172,187 | — 18,637 |
| Luton Corporation ... ... ... | 458 | 459 | 468 | 429 | 456 | 447 | 447 | 449 | 454 | 437 | 26¾ | 11,390 | + 270 |
| Maidstone Corporation ... ... ... | 820 | 824 | 901 | 849 | 1,115 | 868 | 857 | 958 | 901 | 1,210 | 26½ | 24,075 | + 1,667 |
| Manchester Corporation ... ... ... | 40,391 | 40,318 | 40,037 | 40,726 | 41,200 | 41,286 | 40,031 | 41,131 | 41,164 | 41,771 | 27 | 1,094,319 | + 19,084 |
| Middlesbrough Corporation ... ... | 1,710 | 1,752 | 1,642 | 1,823 | 1,719 | 1,556 | 1,478 | 1,560 | 1,583 | 1,552 | 27½ | 43,640 | — 1,833 |
| Newcastle-on-Tyne Corporation ... ... | 12,311 | 12,533 | 12,217 | 12,400 | 12,470 | 11,878 | 11,832 | 11,712 | 11,799 | 12,221 | 26½ | 317,235 | — 9,339 |
| Newport Corporation ... ... ... | 2,507 | 2,429 | 2,412 | 2,406 | ... | 2,404 | 2,440 | 2,555 | 2,461 | ... | 26 | 62,752 | — 248 |
| Nottingham Corporation... ... ... | 1,881 | 1,823 | 1,885 | 1,768 | 1,952 | 1,854 | 2,021 | 1,928 | 1,883 | 1,804 | 26¾ | 48,898 | + 1,184 |
| Northampton Corporation ... ... | 9,549 | 9,837 | 9,717 | 9,672 | 10,552 | 10,096 | 10,104 | 10,200 | 10,460 | 11,169 | 26½ | 273,029 | + 20,100 |
| Oldham Corporation ... ... ... | 4,515 | 5,623 | 5,618 | 5,489 | 5,623 | 4,551 | 5,270 | 5,369 | 5,302 | 5,437 | 28 | 149,070 | — 7,063 |
| Plymouth Corporation ... ... ... | 6,476 | 6,040 | 5,811 | 5,807 | 5,842 | 6,757 | 6,399 | 6,076 | 6,311 | 6,397 | 26¾ | 167,105 | + 10,149 |
| Portsmouth Corporation ... ... ... | 9,649 | 8,457 | 6,939 | 6,732 | 6,107 | 10,237 | 8,524 | 7,562 | 7,192 | 7,211 | 27 | 215,605 | + 24,900 |
| Preston Corporation ... ... ... | 2,343 | 2,312 | 2,263 | 2,237 | 2,279 | 2,292 | 2,218 | 2,232 | 2,226 | 2,192 | 26¼ | 57,834 | — 1,416 |
| Rawtenstall Corporation ... ... ... | 1,404 | 1,374 | 1,308 | 1,323 | 1,410 | 1,324 | 1,332 | 1,289 | 1,269 | 1,344 | 26¾ | 36,191 | — 647 |
| Reading Corporation ... ... ... | 2,664 | 2,488 | 2,539 | 2,504 | 2,548 | 2,523 | 2,495 | 2,498 | 2,605 | 2,494 | 27 | 65,614 | + 548 |
| Rochdale Corporation ... ... ... | 4,555 | 4,632 | 4,477 | 5,047 | 4,387 | 4,419 | 4,196 | 4,304 | 4,310 | 4,420 | ... | 116,009 | — 5,786 |
| Rotherham Corporation ... ... ... | 2,684 | 3,384 | 3,050 | 2,821 | 2,871 | 2,734 | 3,224 | 3,208 | 2,818 | 2,834 | 27 | 75,285 | + 1,983 |
| Salford Corporation ... ... ... | 12,234 | 11,193 | 11,109 | 11,455 | 11,460 | 11,375 | 10,928 | 10,904 | 10,941 | 11,108 | 26½ | 299,645 | — 1,169 |
| Sheffield Corporation ... ... ... | 21,287 | 21,345 | 21,207 | 21,431 | 21,560 | 19,870 | 19,904 | 19,904 | 20,543 | 20,470 | 25½ | 548,561 | — 18,094 |
| Southampton Corporation ... ... | 4,647 | 4,673 | 4,518 | 4,414 | 4,421 | 4,644 | 4,618 | 4,461 | 4,513 | 4,552 | 27 | 117,199 | + 4,313 |
| Southend-on-Sea Corporation ... ... | 3,199 | 2,889 | 2,515 | 2,406 | 2,138 | 3,082 | 2,734 | 2,541 | 2,337 | 2,211 | 27¾ | 73,883 | — 424 |
| Southport Corporation ... ... ... | 2,150 | 1,956 | 1,812 | 1,756 | 1,608 | 2,030 | 1,859 | 1,810 | 1,701 | 1,691 | 26½ | 49,887 | + 214 |
| St. Helens Corporation ... ... ... | 1,993 | 2,099 | 2,015 | 1,996 | 2,008 | 2,090 | 2,107 | 2,064 | 2,099 | 2,039 | 26 | 53,758 | + 2,746 |
| Sunderland Corporation ... ... ... | 3,032 | 2,787 | 2,664 | 2,657 | 2,733 | 2,997 | 3,036 | 2,883 | 2,972 | 2,858 | 27 | 84,239 | + 10,434 |
| Swindon Corporation ... ... ... | 928 | 939 | 895 | 852 | 874 | 1,102 | 958 | 985 | 1,007 | 977 | 26¾ | 26,274 | + 5,063 |
| Wallasey Corporation ... ... ... | 3,829 | 3,646 | 3,488 | 3,222 | 3,271 | 4,011 | 3,566 | 3,612 | 3,328 | 3,370 | 26½ | 100,064 | + 3,059 |
| Walsall Corporation ... ... ... | 3,488 | 3,431 | 3,382 | 3,564 | 3,511 | 3,310 | 3,396 | 3,468 | 3,479 | 3,847 | 27 | 93,591 | + 1,394 |
| Walthamstow Corporation ... ... | 2,611 | 2,473 | 2,546 | 2,551 | 2,570 | 2,533 | 2,439 | 2,474 | 2,477 | 2,521 | 26¾ | 66,663 | — 423 |
| Warrington Corporation ... ... ... | 1,367 | 1,351 | 1,315 | 1,359 | 1,389 | 1,369 | 1,437 | 1,449 | 1,463 | 1,423 | 27 | 37,412 | + 1,669 |
| West Ham Corporation ... ... ... | 6,194 | 6,258 | 6,206 | 6,358 | 6,494 | 5,834 | 5,870 | 5,947 | 6,004 | 6,132 | 26½ | 159,843 | — 208 |
| Wolverhampton Corporation ... ... | 6,086 | 6,119 | 6,173 | 6,260 | 6,311 | 5,711 | 5,673 | 5,883 | 5,774 | 6,038 | 27 | 160,219 | — 6,208 |
| York Corporation ... ... ... ... | 1,579 | 1,546 | 1,667 | 1,674 | 1,531 | 1,569 | 1,509 | 1,633 | 1,595 | 1,562 | 28 | 43,664 | + 1,478 |

## Underground Electric Railways Company of London, Limited.

| NAME OF COMPANY | 1929. WEEKS ENDING | | | | | 1930. WEEKS ENDING | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sept. 7 | Sept. 14 | Sept. 21 | Sept. 28 | Oct. 5 | Sept. 6 | Sept. 13 | Sept. 20 | Sept. 27 | Oct. 4 | Wks. | 1930 | Increase or Decrease |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Underground Co.(Common Fund Co.)... | 304,000 | 290,300 | 299,300 | 307,000 | 299,900 | 309,200 | 285,500 | 301,000 | 308,400 | 310,100 | 40 | 12,040,900 | + 627,800 |
| London and Suburban District ... ... | 45,700 | 46,900 | 45,500 | 46,000 | 45,200 | 45,900 | 45,300 | 45,300 | 46,100 | 46,100 | 40 | 1,773,700 | + 99,700 |

## Colonial and Foreign Tramway Traffic Returns.

| NAME OF COMPANY OR CORPORATION | 1929. WEEKS ENDING | | | | | 1930. WEEKS ENDING | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sept. 7 | Sept. 14 | Sept. 21 | Sept. 28 | Oct. 5 | Sept. 6 | Sept. 13 | Sept. 20 | Sept. 27 | Oct. 4 | Wks. | 1930 | Increase or Decrease |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Anglo-Argentine ... ... ... ... | 88,425 | 86,113 | 84,483 | 81,056 | 91,178 | 77,937 | 78,299 | 77,019 | 80,409 | 82,204 | 40 | 3,277,251 | — 169,890 |
| Buenos Aires Lacroze ... ... ... | 12,206 | 11,908 | 11,599 | 11,111 | 11,836 | 10,913 | 11,175 | 11,175 | 10,563 | 11,541 | 14 | 150,111 | — 11,615 |
| Calcutta ... ... ... ... ... | 125,883 | 128,537 | 131,131 | 125,324 | 129,965 | 107,952 | 108,735 | 113,300 | 114,012 | 106,914 | 39 | 4,416,870 | — 633,233 |
| Madras (2 weeks) ... ... ... Rs. | ... | 47,384 | ... | 38,594 | ... | ... | 51,229 | ... | 43,339 | ... | 38 | 836,526 | + 45,843 |

| | 1929. | | | | | | 1930. | | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | April | May | June | July | Aug. | Sept. | April | May | June | July | Aug. | Sept. | Mths. | 1930 | Increase or Decrease |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Brazilian Trac. $ | 4,012,145 | 4,206,895 | 4,210,893 | 4,335,895 | 4,333,160 | 4,225,416 | 4,127,492 | 4,301,160 | 4,146,884 | 4,081,018 | 3,792,808 | ... | 8 | 32,160,185 | — 516,195 |
| British Columbia $ | 1,205,482 | 1,165,279 | 1,133,017 | 1,156,720 | 1,168,753 | 1,169,278 | 1,213,993 | 1,203,292 | 1,144,585 | 1,196,239 | 1,194,390 | ... | 2 | 2,390,629 | + 65,156 |
| Burma ... Rs. | 64,744 | 66,077 | 63,157 | 61,649 | 61,309 | 59,467 | 65,482 | 66,320 | 66,317 | 66,444 | 66,418 | ... | 12 | 842,707 | — 11,962 |
| Cape Town ... | 29,244 | 29,366 | 27,995 | 27,779 | 27,636 | 26,579 | 27,500 | 27,286 | 25,525 | 24,953 | 24,690 | ... | ... | ... | ... |
| Carthagena & H.... | 1,063 | 725 | 1,476 | 1,100 | 1,169 | 660 | 905 | 552 | 515 | 738 | 505 | 437 | 9 | 7,292 | — 1,458 |
| Durban ... ... | 25,603 | 24,518 | 24,308 | 29,110 | 25,619 | 22,371 | 24,002 | 23,945 | 23,440 | 27,049 | 25,071 | ... | 1 | 25,071 | — 518 |
| East India ... | 3,798 | 3,862 | 3,772 | 3,801 | 4,152 | 4,126 | 3,601 | 3,698 | 3,803 | 3,833 | 3,948 | 3,731 | 2 | 7,679 | — 599 |
| Kalgoorlie... ... | 1,673 | 1,747 | 1,660 | 1,664 | ... | ... | 1,718 | 1,815 | 1,753 | 1,776 | ... | ... | 7 | 11,662 | + 137 |
| Para ... ... | 15,060 | 15,182 | 15,450 | 15,044 | 15,224 | 15,200 | 15,564 | 15,568 | 15,028 | 14,816 | 12,681 | ... | 9 | 131,301 | — 2,022 |
| Port Elizabeth ... | 7,877 | 7,601 | 7,335 | 7,503 | 7,402 | 7,190 | 7,521 | 7,552 | 6,951 | 7,045 | 6,955 | ... | ... | ... | ... |
| Rangoon ... Rs. | 120,855 | 121,040 | 114,535 | 122,630 | 123,550 | 122,850 | 148,215 | 149,440 | 142,170 | 151,300 | 146,320 | 147,775 | 9 | 1,345,030 | + 267,189 |
| Shanghai ... $ | 336,624 | 339,833 | 335,740 | 329,139 | 335,172 | 365,828 | 308,840 | 183,409 | 367,231 | ... | 386,112 | 418,053 | 9 | 3,097,758 | + 101,709 |
| Singapore ... $ | 131,000 | 133,000 | 123,000 | 131,000 | 130,000 | 126,000 | 137,000 | 148,000 | 140,000 | 145,000 | 142,000 | ... | 9 | 1,223,000 | + 140,000 |
| Winnipeg ... $ | 536,033 | 534,954 | 517,738 | 497,935 | 494,642 | 518,521 | 516,132 | 509,709 | 479,958 | 452,212 | 445,908 | ... | 8 | 4,171,624 | — 161,031 |

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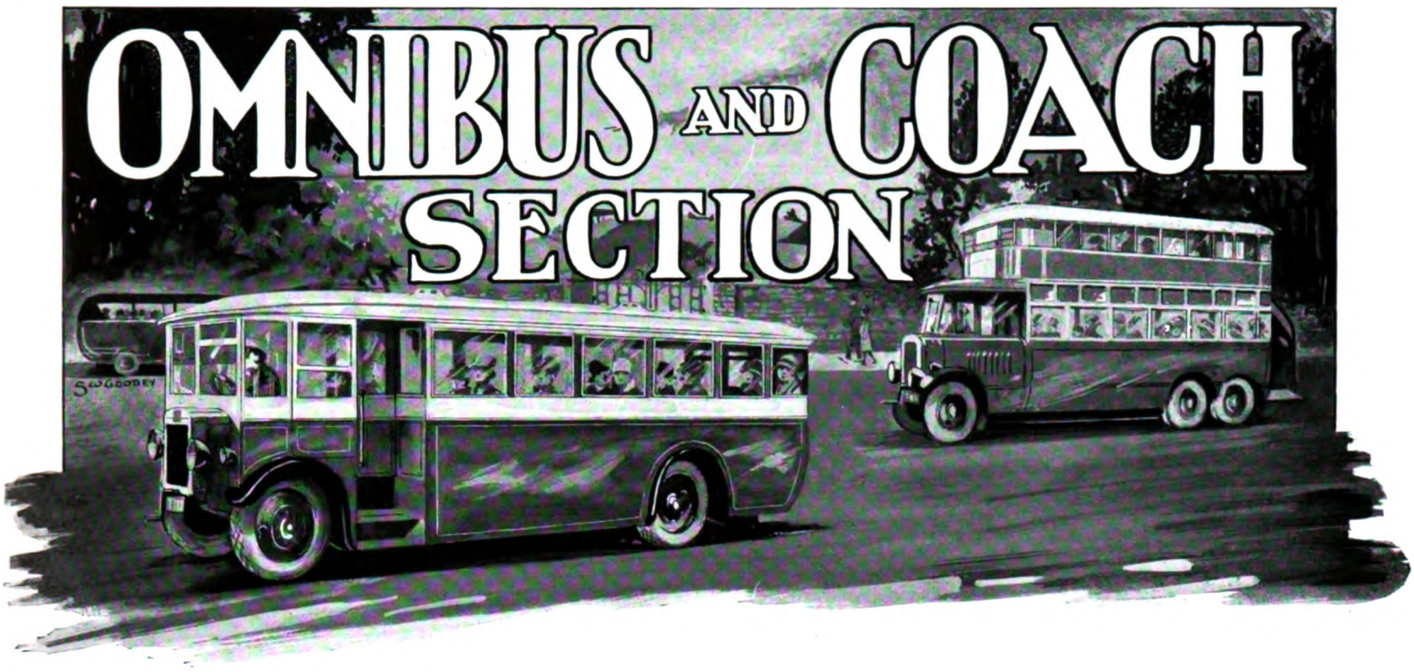


**OMNIBUS AND COACH SECTION—TWENTY-FIFTH YEAR OF PUBLICATION.**

### THE HEAVY OIL ENGINE.

There is now no doubt of the eventual success of the heavy oil engine. Facts enough were provided by Mr. Vane Morland in his paper presented to the Municipal Tramways and Transport Association Conference, and in the discussion thereon, to justify the plea of Councillor Graham Ford, vice-chairman of the Leeds Tramways Committee, that omnibus operators should encourage the builders of heavy oil engines by experimenting with their engines. The first operators in this country to give an extended trial to the Diesel engine were Messrs. Barton Bros., of Beeston, who, for three years, have found the Gardner-built engine a satisfactory means of omnibus propulsion. In 1928, the Royal Automobile Club awarded to the German Mercedes-Benz engine of the Diesel type the Dewar Trophy for the most meritorious performance of the year by an internal-combustion engine. Mr. Morland had been able to tell municipal transport managers at their 1929 conference that the fuel costs of operating a similar type of engine in a double-deck omnibus would be approximately one halfpenny per mile. Practical experiments of Sheffield and Walsall Corporations—the latter using a Gardner engine—have proved that calculation to be correct. The attention that Leeds Tramways Department has for some years paid to the possibility of taking advantage of inventions reported from various countries for reducing the cost of omnibus operation is now bearing fruit. The Department has secured a Diesel engine from the Gardner Works at Manchester and has had it fitted to a Crossley chassis with a double-deck body. The appearance of this omnibus is practically identical with that of the latest type of petrol omnibus as was seen by those who viewed it and tested its successful performance at Harrogate. It is encouraging that British engine designers are persisting in their experiments. The Associated Equipment Company have, for example, evolved a suitable high-speed heavy oil engine on the Acro system which has been thoroughly tested in lorries. The fact that the A.E.C. is producing 100 such vehicles indicates that the makers regard it with confidence. It is well known, too, that the London General Omnibus Co. intend to experiment with this type of engine.

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### SPEED AND FARES.

The experiences of Mr. Priestly at Liverpool and of Mr. Pilcher at Manchester in one aspect of simultaneous tramcar and omnibus operation do not coincide. In an eleven weeks' experiment at Liverpool with omnibuses at higher or economic fares, passengers used the cheaper tramcars where available, and only at peak loading times, and then only one way, were the omnibuses largely patronised. The receipts consequently did not cover the expenses, the loss on the whole of the omnibus services being at the rate of £81,100 per annum. The management therefore concludes that omnibuses cannot be successful in competition with tramways if the fares are materially higher. With the thoroughness characteristic of his work Mr. Priestly is not taking that result as final, and he is proposing, as an experiment, to withdraw the tramcars from certain routes and to substitute omnibuses. It is suggested that this course will test the comparative advantages of the two classes of vehicle and show if omnibuses can serve industrial areas as successfully and efficiently as tramcars. At Manchester an opposite result to the Liverpool experience has been manifested, though it may be said that the circumstances are not exactly similar. For one thing, it is because portions of the Altrincham and Sale routes sadly need track reconstruction that Mr. Pilcher has recommended the substitution of omnibuses. Another cause for that recommendation is that the Altrincham tramway receipts have fallen off because passengers prefer the faster non-stop Corporation omnibuses at higher fares, and because

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# OMNIBUS AND COACH SECTION

the tramcars have also to contend with the competition of unlicensed omnibuses. The same result is developing on the Sale route. There is, however, on the Altrincham route one circumstance that favours the omnibus service. While the speed of the tramcars is 10.68 M.P.H., the express omnibuses average 15.5 M.P.H. In the circumstances set forth in Mr. Pilcher's report it is not surprising that on these 9.5 miles of tramway the Corporation has accepted his advice that if omnibuses were used for both express and ordinary services a more efficient and economical arrangement could be made than is possible with tramcars and omnibuses. That the proposal is a safe one seems to be indicated by the experience gained from the conversion of route 53.

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### TESTS FOR DRIVING LICENCES.

Whatever may be done with regard to driving licences for private motorists under the new Road Traffic Act, there must be complete agreement with the contention we have put forward from time to time that only thoroughly competent men should be entrusted with the lives of the public travelling in road vehicles. That this is the view of the Minister of Transport we have every reason to believe. While it may be difficult to frame regulations to ensure that only A.1 men in every respect should be permitted to drive public-service vehicles, strict supervision should soon eliminate the unfit. Evidence of the care with which the regulations for the licensing of drivers are being compiled is shown by the fact that the Minister of Transport has held a number of conferences with the departments and organisations concerned with road traffic, not the least important of these being the insurance companies. The careless or incompetent driver is always a bad risk for the insurance organisation. They have consequently dealt thoroughly with the matter, and the statistics and information which they have supplied, especially as third party insurance is to be compulsory, should have a great value in the drafting of the final regulations. In the case of private motorists no test of driving ability will be enforced even in the case of those who are known to have some physical disability, provided that they have held a licence for the past six months, declare that their sight is not "extremely defective," and have no liability to disabling fits or other physical disability. New applicants who are affected by the regulations will have to undergo a test of their ability properly to control a vehicle under ordinary traffic conditions. Speaking generally, proprietors of public-service vehicles can be relied upon in their own interests to use the greatest care in the selection of their drivers; but as, unfortunately, there are still operators who regard profit as more important than safety, some measure of control in this all-important matter seems imperative. In view of this fact, due consideration in cases where there is competition should be given by the new Traffic Commissioners to the excellent work done in the training schools maintained at much expense by the London General Omnibus Company and other large operators.

### ENCROACHMENTS OF LONG-DISTANCE SERVICES.

A new line of criticism of long-distance road services was introduced in the paper that Councillor Gledhill submitted to the conference of the Municipal Tramways and Transport Association. It is becoming more and more obvious, he asserted, that in the absence of legislation local authorities were being increasingly attacked by long-distance services, which by their through-town services were worming themselves into shorter-distance services, with very little consideration in many cases by the licensing authority for the interests of the existing services which satisfied the needs of the district. The complaint is not an isolated one, and it arises not only from municipally-owned undertakings, but from private owners as well. That it has assumed the proportions of a grievance was shown last July by Mr. Cecil Power, traffic manager of the Birmingham and Midland Omnibus Company, in his remarks at the Glasgow Conference of the Institute of Transport. Long-distance services, he said, had been tried and their value disproved in the Midlands, and analysis of revenue on such services showed that they could be made to pay only by frequent loading and unloading at intermediate stops. Not ten per cent. of the long-distance services, Mr. Power added, were paying. Fortunately there are some licensing bodies who have the good sense to oppose before the Ministry of Transport appeals made against their refusal to grant the necessary licences. Thus a few weeks ago Swansea Corporation informed the Ministry's inspector that an application for a Swansea-Birmingham-London licence was in reality an attempt to establish short-stage traffic in the Swansea area. Competitive working of these services has become increasingly evident during the past year, with the result that the roads become more dangerous by day and by night. Councillor Gledhill maintains that the regulation of these services by local authorities is impossible after the judgment in the Burnley case heard in the Divisional Court in March last. The tangle should early claim the attention of the Traffic Commissioners, whose decisions will be powerfully aided by the heavy-vehicle speed limit of 30 M.P.H.

### REDUCTION IN PRICE OF PETROL.

The reduction of 2d. per gallon in the price of motor spirit, announced on September 22, will mean a considerable saving to operators of passenger vehicles, and it has been warmly welcomed particularly in districts where trade depression has affected the receipts. Belfast Tramways Committee has been informed that the saving in the omnibus department will be about £1,800 per annum.

In London and for fifty miles round best petrol and benzol is now 1s. 4½d. per gallon, instead of 1s. 6½d. Beyond that area it is 1s. 5d. Similar reduction has been made in the price of commercial petrol. The fuels of Russian Oil Products, Ltd., have been reduced 1½d. to 2d., their best petrol now being 1s. 4d. The reasons advanced for the reduction are stated to be a fall in prices in the U.S.A., a heavy drop in freight charges, and a desire of the oil producers to create a more confident mentality in the business world.

It is estimated that the annual consumption in the United Kingdom totals 000,000,000 gallons. Licensed passenger vehicles in 1929 numbered 97,400, and consumed more than 147,600,000 gallons, valued at £1,230,585. Goods vehicles, totalling 316,000, took 368,000,000 gallons, valued at £3,068,518. Private cars, numbering just under a million, had a consumption of 254,000,000 gallons. Approximately 722,000 motor cycles used 42,000,000 gallons.

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# OMNIBUS AND COACH SECTION

## A BRITISH DIESEL-ENGINED OMNIBUS.

LEEDS CORPORATION TRANSPORT DEPARTMENT'S ENTERPRISE.

Outwardly a new 48-seat double-deck omnibus lately acquired by Leeds Corporation Transport Department differs in no way from the standard Crossley "Condor" chassis and body of that type, but beneath the bonnet there is a change that may effect a revolution in public passenger transport. The power unit is a heavy oil engine of the Diesel marine type, which can be run 200 miles on ten gallons of oil obtainable at 4¾d. per gallon, giving a total cost of 3s. 11½d.

The engine was constructed by L. Gardner & Sons, Ltd., of Particroft, Manchester, where, on the initiative of Mr. W. H. Goddard, M.I.Mech.E., a number of similar engines are being built for use in public vehicles. The engine has six cylinders, with bore 4¼ in. and stroke 6 in. With a compression ratio of 13 to 1 the maximum power curve is 75 B.H.P. Its speed is limited between 350 and 1,350 R.P.M. In a run on September 9 from Leeds to the engine makers' works at Manchester, with the engine

Leeds Corporation Omnibus with Crossley Body and Gardner Heavy Oil Engine.

governed down to about 32 M.P.H., the distance of 52 miles was covered in 2 hr. 37 min., at an average of just over 20 M.P.H., although part of the route was over the Pennine Range.

On September 8 the vehicle was inspected by the members of Leeds Transport Committee, who were taken for a trial run over the Beeston heights, and the results on both occasions were impressive. One feature is the ease with which the engine starts from cold without any aids. This is due to the fact that a double gauze filter mounted on the front cylinder is heated by the engine, thus reducing the viscosity of the oil. The fuel consumption averaged 14·4 miles per gallon. Top gear can be engaged as quickly as the operation of moving the lever permits. A smoky exhaust was given for about thirty seconds on starting from cold, but after that there was only a suspicion of smoke. Of smell and vibration there were no indications inside the omnibus.

The governor automatically controls the amount of fuel injected per stroke according to the engine load. The advantage of the engine being at all speeds under control of the governor is especially manifest when the omnibus has to be manœuvred. In that task the accelerator pedal does not have to be used. By letting in the clutch the load is increased, causing the governor to lengthen the injection period, thus increasing the quantity of fuel available per stroke.

The Leeds experiment is due to the enterprise of Mr. R. L. Horsfield, general manager and engineer of the Transport Department, who had the expert advice of Mr. Goddard. The adaptation of the engine was supervised by Mr. J. S. Broadbent, chief engineer of the Corporation omnibus undertaking.

Thanks to the courtesy of Leeds Tramways Committee the omnibus was brought to Harrogate on the day that Mr. Vane Morland read his paper describing the experiment which he is making with a similar engine at Walsall. Illustrations of the engine are given in our report of the paper. Many of the delegates took advantage of the opportunity to ride in the vehicle, and were greatly impressed by that experience and by the particulars of its working given by Mr. R. L. Horsfield.

## MORE OMNIBUS ROUTES FOR MANCHESTER.

CERTAIN TRAMWAYS TO BE ABANDONED.

Following a report by Mr. R. Stuart Pilcher, general manager of Manchester Corporation Transport, the Transport Committee on September 16 recommended the City Council to abandon the tramway services between Altrincham and Sale Moor and Old Trafford, and that portion of the tramway in City Road used only by the Altrincham services. The Chester Road and Stretford Road tramway routes to Old Trafford, which serve the cricket and football grounds, will be retained. A number of local authorities are concerned, but Mr Pilcher does not anticipate any serious difficulty in getting their consent to the change.

Mr. Pilcher reported that during the past few years the receipts on both the Altrincham and Sale tramway routes have shown a steady decrease, while the express omnibus receipts have steadily increased. There is also competition from unlicensed omnibuses. The increase on No. 53 circular route, which was recently converted to omnibuses, has been extraordinary, and he considers that on the routes now to be changed, omnibuses will be equally successful. The reconstruction of the permanent way would involve an immediate expenditure of £93,865, and Mr. Pilcher had no hesitation in recommending the abandonment of the tramways and the substitution of omnibuses. A total of 39 tramcars will be displaced, but as they are of a good type they can be substituted for obsolete cars on other routes. Mr. Pilcher does not consider any increase in the intermediate fares will be necessary, but some increase in the through fare of 4d. for nearly 9½ miles, which is very low, will have to be made.

The general manager adds: "There is a constant demand for more express omnibuses, but the effect on the tramways has been such that on March 31 last the service of cars had to be restricted. In order to retain the traffic as far as possible, cars have been speeded up. Notwithstanding these improvements, the public evidently prefer the omnibuses, and are prepared to pay higher fares in order to travel in them. This process of reducing the tramway mileage cannot go on indefinitely, as to take off more cars and reduce the service to less than the present ten minutes would not be efficient. Duplicate cars and omnibuses cannot be run on a remunerative basis."

Mr. Pilcher has stated that this must not be taken to mean a general change-over on tramway routes to outlying towns. Other routes will not be similarly treated unless conditions are found to be the same as on the Altrincham route.

The City Council on October 1 approved the change.

## APPOINTMENT OF CERTIFYING OFFICERS.

The Ministry of Transport is about to appoint the certifying officers in the Area Traffic Commissioners' offices, at salaries of £600 to £700 per annum inclusive, with travelling and other expenses on the usual Civil Service scale. The duties of the appointments will be concerned with the issue of certificates of fitness of public service vehicles, and only applicants who have had technical training and practical experience as mechanical engineers will be considered. October 24 is the last day for receiving applications, which have to be made on the official forms.

A YORKSHIRE PANEL NOMINATION.—Chesterfield Corporation has nominated Alderman H. Cropper, vice-chairman of the Transport Committee, to the panel from which one of the traffic commissioners for the Yorkshire area will be selected by the Minister of Transport.

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# OMNIBUS AND COACH SECTION

## PETROL-ELECTRIC OMNIBUS FOR DOUGLAS.

The photograph reproduced below shows one of several single-deck petrol-electric omnibuses recently supplied to Douglas (I.O.M.) Corporation Tramways by T.S. Motors, Ltd. The vehicles seat thirty-four passengers. The order is one of a number of repeat orders that have been received from the Corporation. The chassis is of the type T.S. 17 A, and embodies servo-operated four-wheel

One of Douglas Corporation Petrol-Electrics.

brakes, C.A.V. M.V.R. type electric lighting equipment, and twin pneumatic tyres—38 in. by 7 in. on the rear wheels, and 36 in. by 8 in. on the front. The dynamo and motor have been so arranged as to give the lowest possible floor line, and weight has been reduced wherever possible without sacrificing efficiency. The bodies were constructed by the Northern Counties Motor and Engineering Co., Ltd., of Wigan, and are provided with semi-bucket seats and Strachans' patent drop windows.

## NEW TROLLEYBUS AT BLOEMFONTEIN.

The Karrier-Clough six-wheel double-deck 60-seat trolley omnibus that Messrs. Clough, Smith & Co., Ltd., recently supplied to the Bloemfontein Municipality, has now been delivered and put into

Bloemfontein's Karrier-Clough Trolleybus.

service. This is the first of this type of vehicle purchased by any municipality in South Africa.

City of London Street Accidents.—In 1929 there were 21 traffic fatalities in the City of London, and 818 persons were injured.

## GUY TROLLEYBUS IN SOUTH AFRICA.

A 60-Seater in Use for Demonstrations.

Guy Motors, Ltd., of Wolverhampton, have imported a 60-seat top-covered trolleybus of their manufacture into South Africa for demonstration purposes. The accompanying illustration depicts the shipping of the vehicle for the voyage. A few days after its arrival it was seen at work at Cape Town, where, by arrangement with the Cape Town Tramways Co., it made several successful runs with an improvised overhead system. A deputation was expected from Johannesburg to witness a demonstration. The vehicle, which is accompanied by Mr. F. J. Woodward, a director of the company, is to be taken on tour to other important

Shipping a Guy Trolleybus to Cape Town.

centres of the Union. It will be remembered that recently Mr. J. A. Bromley, general manager, Durban Corporation Tramways and Motors, recommended the gradual installation of the trolleybus in substitution for tramways. Johannesburg Council, which is reorganising its tramways department, is now considering this form of traction.

## A KARRIER APPOINTMENT.

Messrs. Karrier Motors, Ltd., have appointed Mr. G. Martin Gamble, A.M.I.Mech.E., as their sales manager. Mr. Gamble was formerly associated with the company from 1910 to 1919, acting as their first Midland agent in Birmingham, and later joining their sales staff in Huddersfield, subsequently being appointed sales manager. Owing to the rapid development of the business, the transfer of the works to the present extensive building took place during this period, and Mr. Gamble inaugurated the Sales Department, of which he is again in charge.

Mr. Gamble received his mechanical and technical training with Messrs. Tangye and Messrs. Billis & Morcom in Birmingham, afterwards becoming chief assistant to a consulting engineer in that town. For some five years Mr. Gamble was with Messrs. T. C. Aveling & Co., Midland representatives for a number of well-known manufacturers of steam and petrol commercial vehicles. On first joining Messrs. Clayton & Co., Huddersfield, Ltd., now known as Karrier Motors, Ltd., Mr. Gamble was their Midland representative. He afterwards joined the staff at Huddersfield, and during the war was manager of the War Office spares department, later being appointed sales manager. For the past ten years he has been a director of Messrs. Harris & Hasel, of Bristol.

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# OMNIBUS AND COACH SECTION

## LONDON UNITED TRAMWAYS' TROLLEYBUSES.

A preliminary demonstration of the new trolleybus system to be employed by the London United Tramways Co. was given at their Fulwell Depot on October 1. The company has powers for the conversion of twenty miles of its undertaking to this type of traction. The demonstration was a short trial run to show the advantages of the vehicle.

Apart from a few minor alterations in design, the trolleybus used is similar to the fleet of 36 which the Associated Equipment Co. and the English Electric Co. are supplying to the company. The chassis and body are the standard A.E.C. six-wheel model, the lower saloon seating 27 passengers—16 in pairs facing forwards and eleven at the rear facing inwards. The upper saloon seats 33 facing forwards in pairs, except for the rear seat which accommodates three. The staircase is enclosed and easy of ascent.

Type of Trolley Omnibus to be used by the London United Tramways.

The electrical equipment is manufactured by the English Electric Co. An 80-h.p. motor mounted in place of the petrol engine supplies the motive power. Semi-automatic control is given by a foot pedal similar to an accelerator, which has three notches of independent control, after which acceleration becomes automatic. Depression of the brake pedal induces first of all rheostatic braking, followed by vacuum servo operation, on all six wheels, while as an emergency measure full depression brings about normal mechanical braking. There is also a hand brake.

The short trial run showed the characteristic advantages of the present-day trolleybus—simplicity and ease of control, flexibility and silent running. The whine of the trolley-head wheels usually associated with these vehicles has been greatly diminished by the insulation of the trolley arm framework with rubber packing.

Subsequently, Mr. C. J. Spencer, the general manager, explained that the company had thought that since the omnibus in question was available in London it was a suitable opportunity to demonstrate it. Trolleybuses were not by any means new; he had installed some in Bradford in 1911. They offered certain advantages over omnibuses and tramcars, and in this instance the company thought them best suited for the area in which they were to be employed. The trolleybus consumed electricity which was a home-produced source of energy. It did not follow, however, that they would entirely supplant tramways. The company aimed at giving the districts concerned the best possible service from all points of view, and only time would show how that object would develop.

## L.G.O.C. AND COACH RIVALRY.

Twenty independent coach owners in London, who claim to have 400 coaches, have combined against the express services of the Green Line of the L.G.O.C. The independents have introduced new coaches, with cuts in fares, on the London-Maidenhead, London-Windsor, and London-Brentwood services. Mr. C. Dobbs, managing director of the Skylark Company, has taken charge of the combination. He has stated that while it will not be his duty to control the twenty fleets, he would have to determine what services should be placed on any particular routes.

An official of the L.G.O.C. in discussing the situation, deprecated any suggestion of a "war." The company had placed about 150 coaches on various routes within a forty-mile radius. They had been running omnibuses to Windsor since before the war, but traffic conditions were now altered. People now wanted express coaches as well, and the company were trying, as they always did, to meet London traffic needs. Coach services were complementary to the omnibuses. Other services were under consideration.

LEEDS TRAMWAYS COMMITTEE has sanctioned the issuing of tickets enabling passengers to transfer from tramcars to omnibuses and vice versa.

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# OMNIBUS AND COACH SECTION

## MUNICIPAL DELEGATES VISIT KARRIER WORKS.

A number of the delegates having expressed a wish to visit the works of the Karrier Motors, Ltd., at Huddersfield, a special Karrier double-deck omnibus left Harrogate on September 24 and travelled direct to the works. The visitors were welcomed by Mr. H. W. Hattersley, joint managing director of the company, and in parties of six they were conducted through the various departments. In each department much interest was shown in the general arrangement of the works and in the wide range of machine tools, many of which have been specially designed for the production of the component parts of the Karrier chassis. Amongst the departments visited were the capstan bay, gear cutting bay, inspection and machine tool shops, all in the main machine shop; engine assembly shop, chassis erecting and detail assembly department.

At Greenhead Park—One of Huddersfield Corporation Double-Deck "Monitor" type in the foreground.

In the engine shop six different types of engine were in course of manufacture, including the sleeve-valve model introduced by the Karrier Company in 1927. On completion, every engine is submitted to exhaustive tests in the test house, where fifteen engine stands are installed. After being run in on coal gas for a period of six to eight hours, carburettors are fitted and the power and fues tests are carried out by means of Heenan and Froude dynamometers.

Karrier Motors, Ltd., adhere to the policy of producing a wide range of vehicles. These include low-load trucks, industrial vehicles of all capacities, and the rigid-frame six-wheeler for goods, passenger and overseas services, for which the firm were pioneers and have become deservedly famous. Evidence of the continuous demand for the products of the Karrier works was seen in the road testing department, where a large number of chassis of different types—including a batch of six-wheelers for the War Office—were assembled ready for delivery.

## TRANSPORT REORGANISATION IN VICTORIA.

A Bill introduced by the Minister of Railways in the Victoria Legislative Assembly provides for the co-ordination of the railway, tramway and motor omnibus services in the State. It creates a department of transport with a Minister of Transport, and will be composed of railway, road transport and tramway branches. The railway department will be controlled as at present, but the Tramways Board will be abolished when its term expires at the end of the present year. The tramways will be under the control of a Commissioner of Tramways, appointed for five years at a yearly salary not exceeding £1,750. A deputy commissioner is also proposed. The Tramways Commissioner will be unable to purchase material outside Victoria without permission of the Minister.

The Bill provides for the appointment of an Advisory Committee, to consist of the Minister of Transport as chairman, a nominee of each of the railways, tramways, Country Roads Board, manufacturers and sellers of motor vehicles, and owners of freight or passenger motor vehicles combined, and metropolitan and other municipalities, or a total of seven members. Stage motor omnibuses are to come under the same section as omnibuses, the Minister to define not only the route, but the number of omnibuses to be run.

## DENNIS BUSES FOR WEST AFRICA.

THE GOOD AND THE BAD OF OPERATING CONDITIONS.

To Accra, the principal part of the Gold Coast, six Dennis GL type omnibuses have been recently shipped by the United Africa Company, Ltd., of Kingsway, London, and are now in commission within a few degrees of the Equator. Several points of interest attach both to the vehicles and their operating conditions. Fortunately, they are under the close supervision of a competent European engineer, otherwise the combination of native naivete and equatorial climate might prove disastrous, in spite of negligible gradients and roads that are better than might be expected.

The native idea of driving does not include any mechanical sympathy, and it is with good reason that the engines are fitted with governors which confine the top gear speed to 15 M.P.H. This limitation, however, is not very severe in view of the short route mileages. The longest, to Korle Bu, Christiansborg and Labadi, and to Christiansborg and Adabraka, are only six miles each.

The rather unusual seating capacity—24—is made possible partly by sacrificing a proportion of the particularly easy spacing which the length of the chassis customarily allows, and partly by extending the near overhang to an extent that is not permitted in this country by Ministry of Transport Regulations. Overall width of the vehicle is 6 ft. 10 in., which is wider than is customarily permitted by the Accra authorities, and this allows additional space in the gangway. It would appear that full advantage is taken of this, as at week-ends and on festival occasions the load may number anything up to 40.

Several further points of interest peculiar to these machines may be remarked. Firstly, there is the use of single pneumatic tyres. The local authorities hold the opinion that twin tyres create a vacuum when in motion and tend to do harm to the roads by drawing up loose stones and road material. Detachable handles are fitted to the winding gear of the windows, and these handles are kept by the conductors, a regulation that doubtless goes a long way towards maintaining order on the occasions of the above-mentioned festivals. The windows themselves are of ¼-in. plate glass.

One of the Dennis GL Omnibuses Operating within a few Degrees of the Equator.

The vehicles are painted dark green, with a lighter shade for the waist rail, and black mouldings. The Accra Council's arms appear on the rear panels.

It is of interest to note that simultaneously with ordering the above machines, the United Africa Co., Ltd., placed an order for 12 pneumatic-tyred Dennis 30-cwt. chassis for delivery to the same port.

ROYAL ORDER FOR FIVE CARS.—The King and Queen have ordered five "Double-Six" Daimler cars, fitted with the new Daimler transmission system. In communicating the command to Stratton-Instone, Ltd., of Pall Mall, S.W.1, the Crown Equerry states that the order is placed so that it may stimulate British industry, and primarily to relieve unemployment during the winter.

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# OMNIBUS AND COACH SECTION

## ROAD TRANSPORT IN ULSTER.

MERGERS WITH THE RAILWAYS AND LARGE COMPANIES.

Road transport in Ulster has developed remarkably within the last few years and the small proprietor is rapidly vanishing. The amalgamation of over thirty small companies into the Belfast Omnibus Company, Ltd., was a big step in this direction, and the absorption of many omnibus proprietors by the railway companies was another factor.

The manager of the Belfast Omnibus Company, Mr. James McCrea, some months ago completed the transfer of 100 of the company's County Antrim cars to the L.M.S. Railway (N.C.C.). The money so realised is to be used in consolidating the company's position in regard to the rest of their services. Some time ago the B.O.C. opened an omnibus station in North Street, Belfast, equipped with waiting rooms, enquiry office, parcel office, etc., and for most of their services passengers board and alight inside this station. The B.O.C. confine their activities to Ulster and at present do not run any services in the Free State. It was announced on April 17 that the transfer of Spence's Ballynahinch service to the B.O.C. had been arranged. This involved about nine omnibuses, and the drivers and conductors have also been taken over. It is a very satisfactory arrangement and will enable this service to be run more economically, as formerly there was some friction between the two operators.

H. M. S. Catherwood, Ltd., have, from time to time, bought up small services, and are now in a very strong position in the districts which they serve. For some time this company has had an up-to-date omnibus station in Library Street, which is provided with a book and flower stall and the usual parcel and enquiry offices.

An important part of road transport in Ulster is the arrangement of tours for visitors to the Emerald Isle. Messrs. Catherwood are the foremost people in this line, and each year they run tours round Ireland, also a tour in Scotland. They issue an attractive illustrated booklet and have appointed booking agents all over the United Kingdom and in the U.S.A. and Australia. These tours are run in luxurious Leyland sun-saloon coaches. Both the B.O.C. and H. M. S. Catherwood, Ltd., run daily tours during the season from Belfast and elsewhere, which are likely to attract a good many visitors from overseas.

The L. M. & S. Railway (N.C.C.), who have recently bought over 130 omnibuses, principally from the B.O.C., have a monopoly of transport on many important roads in Antrim and Tyrone. It was recently announced that this company had acquired Smithfield Mill, Belfast, which was closed over a year ago, owing to the depression of the linen trade, and mean to convert it into a first-class station for their services. Another impetus to travel by their road services is the decision to close several railway stations.

All operators on the Belfast-Hollywood road have been acquired by the Belfast & County Down Railway, who also run omnibuses in connection with their train services in the Ards Peninsula.

IS A PASSENGERS' COMBINE ILLEGAL?

A scheme was put forward to Hollywood passengers some weeks ago by Mr. T. McClements, having for its object the formation of a passengers' combine to run vehicles between Belfast and Hollywood. The promoter of the scheme maintained that such an arrangement would be within the law, as only members would be carried and the omnibuses would not be plying for hire. The Ministry of Home Affairs for Northern Ireland called a meeting of operators of coaches and private-hire vehicles and Mr. D. L. Clarke, of the Ministry, told them that the Ministry would take away the licences of any operators hiring vehicles to the combine, and these licences could not afterwards be re-issued. He said the Ministry would take drastic steps, if necessary, as the scheme was obviously unsound financially and was of such a nature that it would upset the present road transport arrangements.

The bulk of the Belfast Omnibus Company's fleet consists of A.E.C.'s, and some of the most recent are Daimlers. They have also some Leylands, Albions, and a Karrier six-wheeler. These miscellaneous omnibuses were taken over from companies which were absorbed by them, and it is interesting to note that the Karrier was the first six-wheeler to be run in Ireland.

Practically all the Catherwood omnibuses and coaches are Leylands, but they have a few Daimlers and Albions. The B. & C. D. Railway run Leylands, and the G. N. Railway favour A.E.C.'s. The L. M. & S. (N.C.C.) have a very mixed fleet, but the majority are Leylands and A.D.C.'s.

THE CHANGED SITUATION IN BELFAST.

The Belfast City Tramways have a large and heterogeneous fleet. The original services were run by A.E.C.'s, but when the Corporation bought off the opposition to their tramway services two years ago the Department became the possessors of Leyland, Albion, Gilford and Reo vehicles. The previously uncontrolled opposing omnibuses had seriously affected the tramways, despite the operation of a small fleet of omnibuses by the department. The purchase of the rival fleets was part of a statesmanlike policy on the part of Mr. Chamberlain, the general manager, which has never been equalled in the British Isles. Brought over from Leeds to take the situation in hand, Mr. Chamberlain by patient and convincing effort induced the Government of Northern Ireland to give the Belfast City Tramways a monopoly of public passenger road traffic so long as the department provides efficient services. The first year of the new regime ended on March 31 last, when a net profit of £92,880 was shown on the tramways. Omnibus operation resulted in a net deficit of £20,713, attributable to the low fares. The Tramways Committee has heartily congratulated the general manager on the change which has been effected.

The smaller proprietors mostly favour Leyland and Gilford omnibuses for 32-seaters, and for smaller omnibuses the Dennis and Guy. It appears likely that the small owners will gradually be absorbed in the larger companies, and this will most certainly mean a more satisfactory service for the public.

All the principal companies have efficient works departments, and H. M. S. Catherwood, Ltd., now make the coachwork for their vehicles in their Donegall Road works. The B. O. C. has evolved a system of dock overhauls which ensures that a maximum of cars are on the road, and that all vehicles in use are in good order.

The Bell Punch ticket system is employed by all except the very small companies, and exchange tickets are in use. The B. O. C. has a system by which a "break-journey" slip can be attached to the ticket by the conductor on request, enabling the passenger to break his journey at any specified place en route. Weekly tickets are issued at six times single fare, and monthlies at proportionate rates. Workmen's tickets are provided at low rates, and special omnibuses are available for shipyard workers in the morning.

The Belfast Company's "Everywhere" ticket has met with great success. For the reasonable sum of fifteen shillings the holder can travel anywhere over the company's system for one week. Obviously this is ideal for the tourist who wants to see as much as possible of Ulster at a low cost, and it is found that the idea works admirably.

Parcel traffic is becoming a very important part of omnibus operation in rural areas. Most companies have appointed parcel agents in the villages, and they mostly have depots in the towns. The speed and cheapness of this method of sending bulky packages is much appreciated by Ulster folk. Another boon to country people is the action of the Postal authorities in providing post-boxes on some country omnibuses, enabling the people to post letters up to a much later hour.

The decrease in the cost of petrol is appreciated by all operators. At a meeting of Belfast Tramways Committee, it was mentioned that the decrease would mean a saving to the Department of £1,600 per annum.

## NEWCASTLE OMNIBUS STATION.

The City Corporation has approved of a report submitted by the Watch Committee concerning the Marlborough Crescent omnibus station. It is proposed to roof the site at a cost of £4,394. The companies using the station will jointly pay £2,050 per annum, while the Corporation will pay £300 for the municipal omnibuses. The total income is estimated at £3,549, and the annual cost at £3,475.

## ANOTHER COACH STATION FOR LONDON.

On a corner site of about an acre and a-half, facing the Buckingham Palace Road side of Victoria Station, Southern Railway, a motor-coach station is to be built. The site realised six figures for the freehold and leasehold interests. It was formerly occupied by shops and houses known as 164–186 (even), Buckingham Palace Road, and 1A–15 (odd), Elizabeth Street.

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# OMNIBUS AND COACH SECTION

## OMNIBUS AND COACH SERVICES.

### MUNICIPAL.

SOUTHPORT'S REQUIREMENTS.—Two tramway routes at Southport are to be abandoned and omnibuses substituted. The Tramways Committee has decided on the purchase of fourteen double-deck omnibuses at a cost of over £20,000.

NEW GARAGE FOR SOUTHEND.—The borough surveyor of Southend is preparing plans for submission to the Transport Committee of a garage which is required in view of the proposed purchase of more omnibuses and the extension of the trolleybus routes.

NEW SERVICE FROM BURY.—On September 6 Bury Corporation instituted an omnibus service from Bury to the Stopes terminus at Radcliffe. The tramcars on that route are now used only during the periods of the workpeople's traffic, as is also the case on the Black Lane-Whitefield route.

STOCKTON AND THORNABY AGREEMENT.—Thornaby Council have entered into an agreement with Stockton Corporation on the question of motor omnibus operation. The mayor remarked that Thornaby Council could congratulate themselves on the manner in which Stockton had met them.

THE PROPOSED BRIGHTON MERGER.—On condition that it is withdrawn in the event of the Bill for the merger of local transport not passing through Parliament, Brighton Corporation are permitting Thomas Tilling, Ltd., to start an omnibus service between Preston Circus and the sanatorium.

ADDITIONAL SERVICES FOR NOTTINGHAM.—The Corporation of Nottingham proposes to operate omnibuses on six routes in the urban districts of Arnold, Carlton, and West Bridgeford, and in the rural districts of Basford and Bingham, and has applied for the consent of the Minister of Transport.

A PROPOSED ABERDEEN SUBSTITUTION.—In consequence of the loss on the Ferryhill tramway service, and the need for renewal of the track, Aberdeen Tramways Committee recommend that petrol omnibuses should be substituted. The Council recently decided to discontinue the tramcar service on another route.

MANCHESTER OMNIBUS GUIDE.—A guide to the municipal omnibus services has been issued by Manchester Transport department. Another useful publication is a map that gives particulars of the tramway and omnibus routes, together with information regarding starting points, fares, and places of interest.

SEASON TICKETS AT ABERDEEN.—A reduction of 20 to 25 per cent. on the omnibus season tickets is recommended in the annual report of Aberdeen Tramways Committee. The omnibus services had a revenue of £90,671 in 1929-30, an increase of £14,272, the gross profit being £17,971. The passengers totalled 17,285,230.

THE FIRST CHANGE-OVER AT DERBY.—The tramway service on Nottingham Road, Derby, will, it is understood, be discontinued this month, and an omnibus service substituted. This will be the first tramway route to be changed over, although an omnibus service has been in operation on the Uttoxeter-Burton Road for some time.

OMNIBUSES SUBSTITUTED AT BARNSLEY.—The tramway services of the Yorkshire Traction Co. between Barnsley and Worsbro' Bridge-Worsbro' Dale, and from Barnsley to Smithies, have been withdrawn, and omnibus services substituted. The last tramcar was driven by Mr. Arthur Wood, traffic superintendent, who also drove one of the first cars when they were introduced in 1902. A last special car was driven by Mr. G. W. Robinson, general manager.

A SUNDERLAND EXPERIMENT.—During the 26 days of August on which tramcars were used on the Villette Road route, Sunderland, there were 201,396 passengers, a daily average of 7,746. On August 27 motor omnibuses took over the service, and during the remaining five days of the month, 43,043 passengers were carried —a daily average of 8,609, or 863 more per day than on the tramcars. Receipts increased by more than £3 a day, a figure which, if maintained, will mean an increase of nearly £1,100 per annum.

SECOND NEW GARAGE AND MORE OMNIBUSES FOR GLASGOW.—The Transport Committee of Glasgow Corporation has recommended the erection of a garage at Anniesland to accommodate 200 omnibuses. The initial expenditure will be £35,000, and the total cost is estimated at £80,000 to £90,000. Building ideas gained by the deputation which visited Germany some months ago will be used. Not long ago a garage was opened in Victoria Road, but it is inadequate in view of the 100 additional omnibuses which the Corporation recently purchased. Before the end of the year the fleet may be increased to between 300 and 400.

COMPETITION AT DERBY.—In his report for the year ended March 31, Mr. P. W. Bancroft, manager of Derby Corporation Tramways and Omnibuses, states that there will have to be a check to omnibus competition with the tramways if the undertaking is to be restored to a satisfactory financial basis. Omnibuses have taken a large proportion of the passengers who used to walk from points beyond to the tramway terminus, and the increase of the Corporation omnibus services has also affected receipts. The rush-hour omnibus services are unprofitable, as they hold up a large proportion of the fleet for very short periods of work.

THE MANUFACTURE OF OMNIBUS BODIES.—The Transport Committee of Glasgow Corporation has asked the town clerk to report on a proposal to incorporate a company to manufacture motor omnibus bodies. It will be remembered that the House of Lords' Committee last session deleted from the Corporation Bill a clause under which the Transport Department would be authorised to build omnibus bodies in the tramcar workshop. Councillor Dollan, chairman of the Transport Committee, has explained that it was suggested that members of the Committee should hold the shares so long as they were members of the Corporation. As the number of omnibuses increased and the number of tramcars decreased it was obvious that men now engaged in making tramcar bodies would have to be dismissed unless they could be transferred to building omnibus bodies.

### COMPANY.

TOURING IN SEPTEMBER.—During September the Merseyside Coach Services ran five-day trips through the Wye Valley and the Shakespeare country.

A LIMERICK GARAGE.—On a site near the goods depot of the Great Southern Railway, Limerick, the Irish Omnibus Co. has erected a garage and repair shops. It is also to be utilised as a central station.

LICENCES FOR OVERFLOW TRAFFIC.—Weston-super-Mare Council has granted licences to Bristol Tramway & Carriage Co. in respect of six coaches to be used solely for dealing with overflow traffic on country routes.

WARNING TO OWNERS AT STOKE.—At the request of the Highways Committee, the town clerk of Stoke-on-Trent has warned omnibus owners not to have their vehicles swept out in the streets. They have also been requested to fit boxes for used tickets.

TOP COVERS IN CALCUTTA.—A new rule inserted in the Calcutta and Howrah Motor Vehicles Rules (1930) makes it obligatory that the top deck of every double-deck motor vehicle to be used for the conveyance of passengers shall be provided with a proper roof.

PROPOSED SUBSTITUTION AT CORK.—It is reported that the directors of the Cork City Tramways are considering the substitution of omnibuses for the tramways and are about to enter into negotiations with the Corporation in order to arrange for an "all-in" passenger service.

NATIVE-OWNED OMNIBUSES IN UGANDA.—Dr. Kitching, Bishop of the Upper Nile, stated at the Church Missionary Society's Congress in London, on September 23, that native-owned motor omnibuses, bought on the instalment system, are now to be seen everywhere in Uganda.

BRITISH OMNIBUS CONCESSION FOR CAIRO.—The Overseas Motor Transport Co., Ltd., of Victoria Street, London, has secured a concession to operate omnibuses in Cairo. The vehicles, which will be of the latest type, will be supplied by John I. Thornycroft & Co., Ltd., of Smith Square, London.

OMNIBUSES AT CAPE TOWN.—The Traffic Committee of Cape Town Corporation reports that there are 260 omnibuses in service in the city, the ownership being as appended: Triangle Bus Service, 147; Cape Town Tramways Co., 67; Circle Service, 28; Camps Bay Bus Service, 14; private owners, 4.

ONE-MAN OMNIBUS IN OUTER LONDON.—The London General Omnibus Co. is experimenting with one-man operated single-deck omnibuses in the Uxbridge district. Six vehicles, each seating 18 passengers, are in service. Passengers enter through a door at the side of the driver, to whom the fares are paid.

PROPOSED STATIONS IN GLASGOW.—It is understood that the combined omnibus companies operating in Glasgow are considering the erection of four large stations in the city at an estimated cost of £150,000. They desire the assurance of the magistrates that these stations would be recognised as stances.

A NEW LONDON FIRM.—Mr. G. Readings has started the Blue and White Coaches, Ltd., at 137-143, High Road, Chiswick, where he has acquired a garage and filling station. Mr. Readings formerly

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# OMNIBUS AND COACH SECTION

carried on the successful Black and White Motorways, which was acquired by the Birmingham and Midland Omnibus Co.

THE COMING OF THE ROAD TRAFFIC ACT.—Bearing in mind the large number of omnibuses now licensed in Skipton, also that the licensing powers of the Council will come to an end in October, Skipton Council on September 16 refused to grant Wallace Arnold Tours, Ltd., licences for six omnibuses used on their Leeds-Morecambe-Blackpool service.

CHANGES OF OWNERSHIP AT STOKE.—The Watch Committee of Stoke-on-Trent has been informed that the Associated Bus Companies have effected mergers with Mr. F. Macdonald and Mr. A. J. Dunn; that the Milton Bus Service has acquired the business of Messrs. Buckley and Cookson, and that Mr. T. Beckett has purchased the omnibuses of Messrs. Evans and Finney.

LICENCES ORDERED TO BE ISSUED.—As a result of an inquiry held by a Ministry of Transport inspector, the Minister has directed Merthyr Corporation to issue three licences to the Rhondda Tramways Co., and three to the Imperial Motor Co., for omnibuses to ply between Merthyr and Cardiff. No order has been made in the appeals by four other owners against similar refusals.

NEW SOUTH-WEST YORKSHIRE SERVICES.—The Joint Omnibus Licensing Committee for the South-West Yorkshire area recommend approval of a licence to Mr. L. Baddeley, Huddersfield, for a three-hourly service between Huddersfield and Sheffield, via Deepcar, New Mill, and Honley; and a licence to Haigh, Ltd., Holmfirth, for a service from Scholes to Huddersfield via Cross and Holmfirth.

CO-ORDINATION IN YORKSHIRE.—As the result of an agreement entered into between the L.M.S. Railway Co. and the Halifax Joint Omnibus Services (run by Halifax Corporation, the L.N.E.R., and L.M.S.R. Companies), passengers who purchase return tickets at Hebden Bridge or Mytholmroyd for Halifax, or *vice versa* will have the option of using either train or omnibus for the outward or home journey.

FARNBOROUGH-PORTSMOUTH SERVICES.—Farnborough Council recently granted licences to Underwood Express Services, Ltd., in connection with an omnibus service between Farnborough and Portsmouth. At the September Council meeting a letter was read from the Aldershot Traction Co. complaining of this action on the ground that the existing services were adequate. The letter was allowed to lie on the table.

L.G.O.C. WINTER ARRANGEMENTS.—In consequence of the introduction of the winter schedules and a falling off in summer traffic 250 men recently became surplus in the London General Omnibus organisation. It is announced that they are to be retained on the basis of a 40-hour week for the winter period. The company has added a service to St. Albans to their express omnibus services from the Victoria Embankment.

DEMAND FOR 100 PER CENT. EXCESS FARE.—Oldham Corporation has agreed to extension of the omnibus service of Mr. T. H. Parker on the Oldham-Blackpool route on the condition that the intermediate fares are 100 per cent. in excess of those charged on the tramway and omnibus services of the Corporation. For some time it has been a cause of complaint by municipal authorities that the present excess charge of 50 per cent. is no protection.

CHANGES OF OWNERSHIP.—The London Midland and Scottish Railway and the Llandudno and Colwyn Bay Electric Railway have jointly acquired the omnibus services operated by North Wales Silver Motors, in the Colwyn Bay district and are being granted additional licences. The L.M.S. Co. has also, in conjunction with Crosville Motor Services, which operate in the Crewe and Chester districts, acquired a controlling interest in the Royal Blue services of the Llandudno Coaching & Carriage Co.

A CHANGE-OVER IN THE CHATHAM DISTRICT.—Early in October the Chatham and District Traction Co. withdrew the tramcars on the 36 miles of track which serves Chatham, Gillingham and Rochester. Omnibuses now provide the services. The company is controlled by the Maidstone and District Motor Services, Ltd., and its name has been changed to Medway Traction Co. The engineer and general manager, Mr. A. J. Bousfield, continues in the same position. The omnibuses are 48-seat double-deck Leylands. Heating is provided, controlled by the driver. Application has been made for 51 licences.

**LONG-DISTANCE.**

EDINBURGH-NEWCASTLE SERVICE.—The Scottish Motor Traction Co. has instituted a limited stop service between Edinburgh and Newcastle.

PORTSMOUTH TO CHATHAM.—Brighton Corporation has granted two licences for express coaches between Portsmouth and Chatham, via Brighton, to the Olympic Motor Services, Ltd.

MANCHESTER ENTERPRISE.—Majestic Services, Ltd., of Oxford Road, Manchester, are continuing during the winter their day and night services from Regent Street, London, to Glasgow, via Oxford, Birmingham, Manchester and Carlisle.

THE "CROSVILLE" IN LONDON.—Crosville Motor Services, Ltd., claim the largest daily express service between Liverpool and London, via Crewe, Chester and Birkenhead. Their London terminus is at the Central London Coaching Station, W.C.1.

A MIDLAND LINK WITH THE SOUTH.—Alchin Luxury Coaches, which have for some years been running from Northampton and Birmingham to Torquay, have extended the itinerary to Brighton, Eastbourne and Hastings. In London a call is made at the Victoria Embankment. Daimler coaches are used.

FROM SCOTLAND TO THE SOUTH COAST.—Morning, noon and night Orange Bros., of Newcastle-on-Tyne, are operating coach services in each direction between Edinburgh, Glasgow, Newcastle, and many intervening towns to London. The return fare between London and the Scottish terminals is 50s. Through bookings are given to South Coast towns.

COMPETITION ON LONDON-EDINBURGH-GLASGOW ROUTES.—The Scottish Motor Traction Co. announce two services a day from Great Scotland Yard, Northumberland Avenue, London, to Edinburgh. From the same place the Midland Bus Services run morning and evening to Glasgow. In each case the single fare is 30s. and the return 50s.

"COVERING BRITAIN."—Over seventy towns in England, Wales and Scotland are now terminal points of services run from the London Coastal Coach Station at Lupus Street, Vauxhall. Hundreds of towns are catered for on the seventy routes, which are all described in a free guide of 112 pages entitled "Covering Britain." The facilities offered dominate the London newspaper advertisements.

RIVALRY FOR SEA PASSENGERS.—Tourist Coaches run nine times daily from the Victoria Embankment to Southampton, three times daily to Bournemouth and daily to Torquay and Plymouth. There is evidently competition to secure liner passengers, for daily services are also operated to Southampton by Royal Blue Services (Bournemouth) and Modern Travel, Ltd., the period return fare being 10s. 6d.

EAST YORKSHIRE MOTOR SERVICES.—Under the name of the "East Coast Express" a daily service is operated by the East Yorkshire Motor Services, Ltd., between Scarborough and London, via Doncaster, Nottingham, Leicester, Bedford, and other towns. The "Southern Express" is the title given to a daily service between Hull and London, passing through the same towns as the "East Coast Express" does. The terminus for each service is at the London Coastal Station.

PROGRESS OF EASTERN MOTORWAYS.—In two and a half years Harrison and Ives, Ltd., who own Eastern Motorways, have acquired over thirty omnibuses of the single-deck type. Four services daily are run between Norwich and London, where the vehicles are garaged at the London Terminal Coach Station. A new service this year has Birmingham as its terminus. There are also daily runs to Leicester. The vehicles in use comprise Daimler CF6, A.E.C. "Regal" and "Reliance" coaches, the "Bristol" superbus of the Bristol Tramways and Carriage Co., and the "Gilford" coach of the Gilford Motor Co.

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SUPER-TOOLS, LTD., 137, Victoria Street, London, S.W., with whom is associated the Tool Steel Gearing and Equipment Co., Ltd., are specialising in tools and equipments particularly applicable to omnibus maintenance. An extensive range is available and immediate delivery can be given. The specialities include patent detachable files, lifting jacks of various types, tyre changers for rims of all kinds, capable of dealing with tyres up to 9 in., cylinder grinders, valve re-seaters, crankshaft truers, etc. Attention is particularly drawn to the valve lifters and spring compressors, which are claimed to be capable of dealing with all types of valves and springs.

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# OMNIBUS AND COACH SECTION

## SOME RECENT ORDERS.

RANSOMES, SIMS & JEFFERIES, LTD., have an order from the City Omnibus Co., Ltd., Kentish Town, for five 62-seat double-deck top-covered omnibus bodies.

SOUTHPORT TRAMWAYS COMMITTEE has ordered fourteen double-deck omnibuses from the Vulcan Motor & Engineering Co. (1906), Ltd., Southport, at a cost of over £20,000.

MATHER & PLATT, LTD., of Manchester, have an order from Derby Corporation for the installation of the Grinnell sprinkler system for fire extinction at the omnibus garage.

MANCHESTER TRANSPORT COMMITTEE has accepted the tender of J. H. Billings & Co., of Manchester, for the extension of garage accommodation at the Claremont depot, Rusholme.

J. W. COURTENAY, LTD., of Amberley House, Norfolk Street, London, W.C.2, have been appointed by Newport (Mon.) Corporation sole advertising contractors for their motor omnibuses.

GLASGOW TRANSPORT COMMITTEE has recommended acceptance of the tenders of the Vulcan Motor and Engineering Co., Ltd., and Leyland Motors, Ltd., for the supply of air brakes for motor omnibuses.

THE ALBION MOTOR CAR CO. has supplied 12 4-ton tipping wagons to the Singapore Municipality, following a trial of several 2½-ton and 4-ton wagons of that type. The machines have a 35-55-H.P. engine, and are fitted with pneumatic tyres.

DENNIS BROS., LTD., have a repeat order for fourteen "Dart" 20-seat omnibuses from the London General Omnibus Co., from Oxford County Council for five 30-cwt. hand-operated tipping lorries, from Glasgow Corporation for a motor fire engine, at £1,500, and from Wimbledon Corporation for a six-cylinder motor fire-engine with first-aid tank outfit.

LEYLAND MOTORS, LTD., have received the following orders for passenger vehicles: Chatham and District Traction Co., 37 "Titan" omnibuses; Wigan Corporation, 10 "Titan" omnibuses and 20 chassis; Leigh Corporation, three omnibuses; Sheffield Corporation, five double-deck and five single-deck omnibuses; Croydon Education Committee, two omnibuses.

BRISTOL TRAMWAYS & CARRIAGE CO., LTD., have received the following repeat orders from users of their passenger vehicles: Norwich Electric Tramways, three type B 4-cylinder, 4-wheel chassis; Rotherham Corporation, seven type B 4-cylinder, 4-wheel chassis; West Riding Automobile Co., Ltd., twelve 30-seat saloon omnibuses mounted on type B 4-cylinder chassis.

GUY MOTORS, LTD., have received the following among other orders: Mr. Good, of Seaton (Devon), six-cylinder "Conquest" coach, for the London-Exmouth service, and a 26-seat four-cylinder coach; Teignmouth Council, 30-cwt. dual purpose lorry; Swansea Corporation, 6-ton cable drum lorry; the Torquay Carriage Co., Torquay, and Mr. Walters, Barry (Glam.), omnibuses.

JOHN I. THORNYCROFT & CO., LTD., have received the following among other orders for various types of freight and passenger vehicles: Buenos Aires Pacific Railway Co., Ltd., six 3-ton six-wheel chassis; Central Uruguay Railway Co. (of Monte Video), Ltd., three 30-cwt. chassis; The China Bus Co., of Hong Kong, three 20-seat omnibus chassis; Boots, Ltd., of Nottingham, three 6-ton six-cylinder freight chassis; the Distillers Co., Ltd., three 4-ton lorries. Repeat orders for one or more Thornycroft vehicles have been received from Talbot Serpell Transport Co., Ltd., Reading; Belfast Co-operative Society, Ltd., Joseph Crosfield and Sons, Ltd., Northern Butchers Hide & Skin Co., Ltd., Leeds; and Allen Everitt & Sons, Ltd., Smethwick.

THE ASSOCIATED EQUIPMENT CO., LTD., have received the following orders:—Passenger vehicles: "Regent" double-deck, Bassett & Sons (2); "Regal" single-deck, Ayr and District Motor Services (3), T. Severn & Sons, Stockton Corporation and Timpson and Sons (38); "Ranger" single-deck, Timpson & Sons (10), 20-seat single-deck, Timpson & Sons (12). Goods vehicles: "Mercury" 3½-ton, Anglo-American Oil Co. (2); "Monarch" 4-ton, Mutter Howey & Co., W. Curtiss & Sons, Stockport Co-operative Society; "Majestic" 6-ton, B. I. Transport Co.; 7-8-ton, Pickfords, Ltd. (3), H. & G. Simmonds (2), L. W. Holdsworth, J. Hanson & Sons, Strood Engineering Co., Hall & Sons, Warpool Transport, Lashley & Sons, and F. Edlin; "Mammoth" 7-8-ton, D. & H. Cuff, S. Marshall & Sons, J. A. Meeks & Sons; six-wheel freighter, Pickfords, Ltd.; 6-ton 1929 model, ex-Army Transport. Overseas orders: "Regal" single-deck Urania Bil, Stockholm (3); "Regal" single-deck, Lima Tramways (Metropolitan Bus Co.).

GLASGOW TRANSPORT COMMITTEE has asked for delivery of six omnibuses per week from each of the contractors who are supplying the hundred double-deck omnibuses recently ordered. Leyland Motors, Ltd., received a contract for 75 chassis, and the Vulcan Motor & Engineering Co. (1906), Ltd., are providing 25 chassis. F. D. Cowieson & Co., of Glasgow, are building all the bodies.

CROSSLEY MOTORS, LTD., have received, among others, the following orders for omnibuses: Rochdale Corporation, 20 (six-cylinder and "Condors"); Bury Corporation (six-cylinder); Leigh Corporation, three "Eagles," and Aberdeen Corporation 14 "Condors"; Batemen & Fines, Ltd., Notts. (six-cylinder); Norfolk Motor Services, Yarmouth, (six-cylinder); Linklines, Ltd., Glasgow, two "Sixes"; Smith's Motorways, Kirkaldy, two "Sixes"; Air Ministry 63 six-wheelers; the War Office, 14 six-wheelers. Of special interest are orders from Leeds and Sheffield Corporations, which have each ordered a double-deck omnibus with a Diesel engine.

MERTHYR CORPORATION OMNIBUS COMMITTEE has received the following tenders for the supply of four omnibuses: Bristol Tramways and Carriage Co., Ltd., £1,288 8s. 9d. each net, extras, with sorbo rubber flooring, £15 10s. each net, delivery five-seven weeks; Leyland Motors, Ltd., £1,278 15s. each net, extras, with sorbo rubber flooring, £14 each net, N.I.F.E. type K.C.10 cell battery, £24 12s. each net, delivery seven weeks; Dennis Bros., Ltd., £1,218 each net, extras, with sorbo rubber flooring, £10 each net, delivery ten weeks from receipt of order; Associated Equipment Co., Ltd., £1,260 10s. each net, extras, moquette seat coverings, £5 per vehicle, with sorbo rubber flooring £10 per vehicle, if six instead of four-cylinder engine an extra charge of £123 15s. per vehicle.

## MOTOR TRAFFIC NOTES.

BERLIN INTERNATIONAL MOTOR SHOW.—This exhibition, which had been arranged for November, has been postponed until February, 1931.

OMNIBUS STATION IN FALKIRK.—A large omnibus station is to be erected in Falkirk. The first part of the scheme has been sanctioned by the Dean of Guild Court. The station will form the centre of Central Scotland's omnibus traffic.

GOVERNMENT GRANTS FOR ROAD SCHEMES.—In addition to numerous proposals for road improvements already sanctioned for Government grant, the Unemployed Grants Committee has 1,036 schemes to inquire into. The estimated cost of these plans is £14,350,000.

TO FACILITATE PARKING.—As a result of co-operation between the chief constable and the Automobile Association plans are being exhibited in the principal streets and hotels in Wolverhampton showing the car parks, one-way streets, automatic signals, arterial roads and exits.

TRAFFIC CONDITIONS IN OXFORD.—In a report on traffic conditions in Oxford the chief constable states that motor traffic has more than doubled in six years. While there has been a considerable increase in the number of accidents, it has not been in proportion to the increase in the number of vehicles.

INDIAN RAILWAYS AND OMNIBUS POWERS.—Chambers of Commerce in India have asked that the Indian Railways Act be amended to give powers to State and other railways to operate road motor services. Madras Chamber favours that course only if it does not involve Government competition with private enterprise.

PRIVATE CAR WITH A DIESEL ENGINE.—A private motor car, fitted with a Diesel engine, has been driven from Coventry to London and back on top gear on three gallons of crude oil, costing one shilling. Its average speed for the journey of 200 miles was 20 M.P.H. The car was driven by the owner, Mr. C. B. Wardman.

OMNIBUSES FOR ROAD AND RAIL.—Karrier Motors, Ltd., are co-operating with the L.M.S. Railway Co., in producing an omnibus to run both on the railway and on the road. Three vehicles have been constructed, and for a considerable time experiments have been made in the Huddersfield district. The engine when in use on the railway is capable of driving the vehicle at a speed of 60 M.P.H.

HALLEY MOTORS, LTD.—At a recent meeting of Halley Motors, Ltd., the chairman announced that certain negotiations had been entered into with outside interests. We are now able to state that under the arrangement proposed, Halley Motors, Ltd., will continue to trade under their own name and to produce the range of Halley Motors as hitherto.

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THE
Tramway AND Railway World
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LONDON, OCTOBER 18, 1930.

## IMPROVEMENTS IN ROAD VEHICLES.

Mr. Morrison's speech at the dinner of the Society of Motor Manufacturers and Traders on Wednesday night was in essence an appeal to the industry to co-operate in carrying out the reforms affecting construction and equipment under the new regulations. He said little that was not already known, but reiterated his determination to carry out certain advances in road transport for which the time is ripe, and asked manufacturers not to be too conservative in co-operating to achieve higher standards. Mr. Morrison has little cause for complaint regarding progress in design and construction of either private motor-cars or public service vehicles in recent years. Since the war, British manufacturers have had, and still have, heavy financial burdens to contend with, a handicap, however, that has not prevented them from tackling with courage and energy the apparently overpowering position of American car manufacturers, with the result that they are now more than holding their own in design, construction, marketing at home and abroad, and price. It would be disastrous if, under the new regulations, any arbitrary and inadequate time limit was imposed for scrapping existing vehicles. The Minister of Transport does not propose this, but the common interest demands that certain equipment now optional must be made compulsory. Amongst these he mentioned the proposal for the maximum possible use of pneumatic tyres. From January 1 next, no new omnibuses or coaches will be licensed unless they are so equipped, but a reasonable period of exemption, evidently not yet decided, will be allowed existing vehicles and those registered within a year of making the regulations. The compulsory use of air tyres is generally welcomed; it provides smoother riding for the public, and from the operators' point of view prolongs the life of the vehicle, saves the roads, and reduces vibration, thus making for economy and efficiency. Another "step forward" mentioned by Mr. Morrison is really more pressing, but his proposals are less satisfactory—those referring to unsplinterable glass. He is considering a provision to make the use of this glass compulsory for windscreens and other glass fitted in the front of motor vehicles. This is a beginning, but in the near future there will be no reason why the provision should not apply to all glass fittings. The Minister admits that the cost is now more reasonable, and with increasing competition, greater demand and an improved product, the price will come lower still. Here again, ample time is to be allowed for the change to be made in present vehicles, but it is to be hoped that the five years previously hinted at by Mr. Morrison will be reduced in the interests of public safety as well as of motor and vehicle owners.

## THE INSTITUTE OF TRANSPORT.

PRESIDENTIAL ADDRESS BY THE HON. SIR ARTHUR STANLEY.

The 1930-31 session of the Institute of Transport was inaugurated on Monday evening with an address by the new President, the Hon. Sir Arthur Stanley, at the Institute of Electrical Engineers, Victoria Embankment. The compulsory grouping of the railways at the close of the war, he said, entailed fusions of considerable magnitude whose economic administration was now shown to be a task of extreme complexity. The railways had so far failed to secure their standard revenue from the standard charges authorised by the Railways Act. In the last two years, when the charges had come up for revision, the companies, fearing further competition from road transport, had requested the Tribunal to refrain from increasing rates and fares. It was not until 1928 that they took concerted action to secure the right, denied them in the past, of carrying goods and passengers by road. The agreements which they had since entered into with passenger-carrying undertakings throughout the country had confirmed their oft-repeated desire to secure co-ordination rather than to indulge in competition. On the goods side, the railways had not yet seen fit to make extended use of their road-carrying powers. They had taken the wiser course of improving their freight services by a general speeding-up and by the introduction of containers, introducing also a comprehensive system of railhead lorry services. In general it would seem that the railways must rely increasingly on efficient organisation and salesmanship. An Act should be passed enabling them to close branch lines where, in the opinion of the Rates Tribunal or the Minister of Transport, such action appeared justified. An extension of the container system in conjunction with fast goods trains might in time reduce the volume of long-distance traffic which now went by road. Should road services prove to be more economical than railway services the railways must still be maintained. The nation in the long run would have to be responsible for any deficits in railway revenue which might result from the inadequate use of the railways, and it would also have to pay for the provision of the highway accommodation needed to cope with the diverted traffic. Road transport would certainly increase, and the fact that its development would inevitably lead to increased taxation demanded that it should be subject to proper control and supervision. That was why he welcomed the Road Traffic Act, which promised many reforms. The area traffic commissioners would possess almost unlimited powers over the conduct of the road passenger industry, and to them would pass the initiative hitherto possessed by the individual undertaking. The further recommendations of the Royal Commission on Transport, which were to cover the fascinating field of co-ordination and co-operation, would be awaited with interest.

## GLASGOW TRANSPORT ENTERPRISE.

Some interesting statements on Glasgow Corporation transport developments were made by Councillor P. J. Dollan, Convener of the Transport Committee, at the annual dinner of the department on October 9. He said that when the scheme of reconditioning the tramcars, which they were carrying out at a cost of £1,000,000, was complete, Glasgow would have the finest, safest and speediest tramcars in Europe. Stressing the importance of tramcars in the prosperity of the city, Councillor Dollan said that few people realised their value as rate contributors. Since their inauguration they had paid a total of £7,500,000 in rates and other local contributions. Last year the department paid £180,000 in rates, and spent over £250,000 in the repair and renewal of streets, this total representing a saving of 10d. per £ on the rates.

Councillor Dollan expressed his confidence that the neighbouring counties and burghs would co-operate with them in the development of the omnibus services, as they had done with the tramway system. Already Lanarkshire, Renfrewshire, Rutherglen and Clydebank had given permission for the omnibus services to be extended to their areas. Referring to the "serious situation" created by the throwing out by the House of Lords Committee of the provision in the Corporation Bill for manufacturing omnibus bodies, he expressed a hope that the proposal to form a company of members of the Committee would be found in order. He was convinced that a scheme of traffic co-ordination similar to that proposed for London was inevitable in the Clyde area.

The dinner followed the annual inspection, when a visit was paid to the new garage at Larkfield, built at a cost of £60,000, and accommodating 175 double-deck omnibuses, and the Coplawhill car works were also visited. A garage to hold 200 omnibuses is about to be built at Anniesland, and sites for other garages are being prospected. At present, the Corporation has 1,100 tramcars and 250 omnibuses.

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## INTERNATIONAL TRAMWAYS MEETING.

MANCHESTER TO PARIS BY OMNIBUS.

For the special meeting of the International Union of Tramways and Light Railways to be held in Paris on Tuesday and Wednesday of next week, when regenerative control will be discussed and demonstrated, unique transport arrangements, as mentioned in last week's issue, have been made for the conveyance of the British delegation. At the suggestion of Mr. R. Stuart Pilcher, general manager of Manchester Corporation Transport Department and the new President of the Municipal Tramways and Transport Association, the delegates will travel all the way in a British omnibus, except, of course, across the Channel. For the first time a top-covered double-deck omnibus will enter France and will be seen running in the streets of Paris. The vehicle is a Crossley 50-seat double-decker, exactly the same as those in service in Manchester and other British towns.

The omnibus left Manchester on Thursday morning, bringing some of the delegates to London. Yesterday (Friday) morning it picked up the remainder of the party at the Waldorf Hotel, and proceeded to Dover, where it was shipped to Calais, whence it proceeded with the party to Paris. There it will be used in conveying the delegates from place to place as required. The omnibus will bring the party back to Calais on Wednesday, will be ferried to Dover, and then proceed to London and Manchester.

The run to Dover, via Maidstone and Canterbury, proved most enjoyable, the ride being as comfortable as that to be obtained in a high-class private car. The omnibus was shipped on the Channel boat in three minutes.

Special permission has been obtained for the omnibus to run on the Paris streets, the authorities there having given every assistance. The Automobile Association and the Federation of British Industries co-operated in making the arrangements for this unique trip.

Appended is a list of the members of the delegation: General managers: Messrs. A. C. Baker, Birmingham; Wm. Forbes, Cardiff; P. Ellison, Eastbourne; W. R. Elliott, East Ham; R. McLeod (deputy), Edinburgh; J. C. Williams, Erith; L. Mackinnon, Glasgow; A. A. Blackburn, Huddersfield; L. E. Harvey, Ilford; Geo. Rock, Lincoln; R. Stuart Pilcher, Manchester; John F. Cameron, Northampton; W. G. Marks, Nottingham; Ben Hall, Portsmouth; S. Parsons, Ramsbottom; C. L. E. Stewart, Rawtenstall; J. S. D. Moffet, Salford; P. J. Baker, Southampton; W. Vane Morland, Walsall; and C. Owen Silvers, Wolverhampton.

Chairmen, committeemen and visitors: Alderman A. G. Ellaway (vice-chairman), Birmingham; Councillor Adam M. Millar (convener), Edinburgh; Bailie P. J. Dollan (convener), Glasgow; Councillor I. Brassington (chairman), Manchester; Councillor T. H. Adams (member of committee), Manchester; Mr. W. W. Adam, Breda Company, London; Mr. J. Beckett, general secretary, Municipal Tramways and Transport Association; Mr. H. J. Ferguson, "Electric Railway, 'Bus and Tram Journal"; Mr. G. H. Fletcher, Metropolitan-Vickers Electrical Co., Ltd.; Mr. H. Gerrard, engineer, Glasgow Tramways; Major A. W. Hubble, Crossley Motors, Ltd.; Mr. J. M. Manclark, Edinburgh; Mr. J. Manclark, jun., Edinburgh; Mr. W. T. Robson, Equipment and Engineering Co., Ltd.; Mr. W. A. Stevens, Maidstone; Mr. H. E. Townell, J. W. Courtenay, Ltd.; Mr. A. M. Willcox, THE TRAMWAY AND RAILWAY WORLD.

## "SUPERANNUATION ACT NOT WANTED."

*To the Editor of* THE TRAMWAY AND RAILWAY WORLD.

SIR,—With reference to your paragraph *re* the above in your issue of October 11, I would like to correct any erroneous impression that might get abroad in connection with the above.

The first ballot of the traffic employees in connection with the Superannuation Act was taken by the men's own representatives, and produced the result which you publish.

This, of course, proved most unsatisfactory, even from their own point of view, and was the result, I think, of more or less general apathy.

The following week I took the thing in hand myself and had each traffic employee state, when he was receiving his wage, whether he was in favour of the Superannuation Act being applied to this department or not. The result was an overwhelming majority in favour of the Act. The actual result of the ballot showed that 25 men only voted against its adoption. The question of its application will be considered by my Committee.—Yours faithfully,

JOHN F. CAMERON,
General Manager.

Corporation Tramways Department,
Northampton.
October 13, 1930.

## HEADQUARTERS OF TRAFFIC AREAS.

The Minister of Transport announces that the headquarters offices of the thirteen traffic areas specified in the third schedule to the Road Traffic Act, 1930, will be in the following towns:—

IN ENGLAND.

| | | | |
|---|---|---|---|
| Northern ... | Newcastle-on-Tyne | Eastern ... | Cambridge |
| | | South Wales | Cardiff |
| Yorkshire ... | Leeds | Western ... | Bristol |
| North-Western | Manchester | Southern ... | Reading |
| West Midland | Birmingham | South-Eastern | London |
| East Midland | Nottingham | Metropolitan | London |

IN SCOTLAND.

| | | | |
|---|---|---|---|
| Northern ... | Aberdeen | Southern ... | Edinburgh. |

## COACH STATIONS IN CENTRAL LONDON.

OBJECTION BY WESTMINSTER HIGHWAYS COMMITTEE.

A report submitted to Westminster City Council by the Highways Committee states that Mr. F. Pick, managing director of the London Underground Group, had been good enough to explain to the committee the proposals of the L.G.O.C. in reference to the station for the Green Line coaches which is being constructed in Broad-street, Soho. In anticipation of the withdrawal of the existing facilities for taking up and setting down passengers in the streets, the L.G.O.C. proposes to acquire sites for stations for long-distance omnibuses. The site in Soho is merely one of such sites, and the committee believe that others have been, or will be, acquired.

In the opinion of the committee the Broad-street site is unsuitable for an omnibus station, on account of the poor access obtainable along the existing streets to Oxford-street, Regent-street and Shaftesbury-avenue. The proposal of the company will present new traffic problems of great difficulty, and may result in Westminster City Council having to spend considerable sums on street improvements in the area. The action of the L.G.O.C. will undoubtedly tend to cause other companies to secure stations in the central area in order to protect themselves against the operations of the former company.

It would seem desirable, the committee adds, that the Traffic Advisory Committee, which is the main traffic authority for the London area, together with the omnibus companies concerned, should at once consider this question and decide what steps should be taken to prevent the congestion which must arise if coach stations are set up in the centre of Westminster. The committee recommends that the attention of the Ministry of Transport be drawn to the proposed station and to the possible damaging effect on local interests and the obstruction and delay of traffic that may arise from the proposal, and that the Ministry be asked to consider whether steps should be taken to prohibit the placing of such stations in the central area of London.

## LIVERPOOL'S INCREASED TRAFFIC.

At the luncheon of Liverpool Corporation Tramways Committee, which followed the annual inspection on October 8, Alderman F. C. Wilson, chairman of the committee, said that the number of passengers during the year ended September 30 showed an increase over last year of 5,219,600, and the receipts had increased by £26,090. During the year 69 new omnibuses had been placed in service, and 24 tramcars had been reconstructed and 237 thoroughly overhauled. The new single-deck bogie car was the smoothest-running and most comfortable car of its type in the country.

Omnibus fares on most routes had been increased, but although the average fare per passenger was raised by only a small amount —from 1.69d. to 1.74d.—a large number of passengers reverted to the tramcars. The low tramcar fares in Liverpool prevented the successful financial working of omnibus services which operated over any large section of the tramway routes. Liverpool was one of the first undertakings to operate omnibus services, and they would continue these, or any other type of vehicle, to the suburbs if the ratepayers patronised them adequately, but the undertaking must be run on commercial lines.

Mr. P. Priestly, general manager, said that the new type of bogie tramcar had roused the interest of the London County Council, while Lord Ashfield's representatives had given orders for a similar one to be constructed. The car which Mr. Priestly referred to was described and illustrated in THE TRAMWAY AND RAILWAY WORLD of October 17, 1929.

## PERSONAL.

**Sir James Lithgow, Bart.,** who was one of the original members of the Central Electricity Board appointed in 1927, has resigned owing to the pressure of his other duties, and the Minister of Transport has appointed in his place **Sir Ralph Lewis Wedgwood,** chief general manager, London & North-Eastern Railway Company.

**Mr. L. V. Williams,** who was formerly attached to the Birmingham depot of the Associated Equipment Co., and is well known in the Midland counties, has been appointed to represent that company throughout North Staffordshire. His headquarters are at the new branch premises at Halifax Chambers, Market-square, Hanley.

**Mr. H. A. Blackburn,** general manager of Keighley Corporation Tramways, who was recently appointed general manager of Great Yarmouth Corporation Tramways, has been presented by the chief officers of the Keighley Corporation with a canteen of cutlery, and by the office staff and employees of the tramways with an inscribed barometer.

**Mr. W. Vane Morland,** general manager and engineer of Walsall Corporation Tramway and Motor Services, has been voted a payment of 100 guineas for special services rendered to the Corporation in the promotion of the Walsall Corporation Bill, 1930. The proposal laid down in the Bill for the compulsory acquisition of the remaining tramways in Darleston and Wednesbury, belonging to the South Staffordshire Tramways (Lessee) Co., Ltd., was the subject of a lively controversy in the Committee Rooms of Westminster, the proceedings being marked by some amusing passages between opposing counsel and Mr. Morland. Ultimately the Walsall scheme was accepted by the Lords' Committee, and came before the House of Commons as an unopposed measure.

**Mr. John MacGregor,** late chairman of Johnson & Phillips, London, S.E., left estate valued at £30,744 gross and £22,236 net.

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## MISCELLANEOUS NEWS AND NOTES.

**Yorkshire Panel Nomination.**—Sheffield Corporation has nominated Alderman F. Thraves for appointment as one of the three commissioners for the Yorkshire traffic area.

**An Aberdeen Proposal Deferred.**—At a meeting of Aberdeen Council on October 6 the Tramways Committee's recommendation to scrap the Ferryhill tramway service was taken back for further consideration.

**A New Ticket Punch.**—Leicester Tramways Committee is experimenting with a ticket punch which, using a standard ticket for the whole service, stamps the stage, trip, code, class and fare. It works on the system of a cash register and costs £15.

**A Rochdale Substitution.**—Rochdale Tramways Committee has decided to abandon the running of tramcars on the Norden route, and the Norden District Council has approved. It is understood that the change over to omnibuses will take place in December.

**Improved Croydon Cars.**—The last of the ten bogie truck cars run on the Thornton Heath route of Croydon Corporation Tramways has been fitted with a top cover. The fitting of the top covers was carried out at the tramways depot, and the ten cars have been entirely modernised.

**Fewer Railway Passengers Killed.**—The Ministry of Transport reports that in 1929 the number of passengers killed in train accidents was three. With the exceptions of 1923 and 1925 that total was lower than in any year for ten years. There were 507 passengers injured, as against an annual average of 552.

**Future of Plymouth Tramways.**—Alderman Miller, chairman of Plymouth City Transport Committee, states that the time is near for deciding whether tramways are to be abandoned in the city and some new means of transport adopted. He states that 75 per cent. of the track needs reconstruction, and the cost would be from £15,000 to £17,000 per mile. There is also a large capital outlay to be paid off.

**Belfast's New Cars.**—It is anticipated that by the end of the present year a number of new cars and double-deck omnibuses ordered by Belfast Corporation will be in service. The twenty-five cars which were ordered from the Brush Electrical Engineering Co., Ltd., will probably be running by December, when an equal number of old cars will be scrapped. Some of the double-deck omnibuses may be in service early in November.

**Reduction in Permanent Way Staff at Manchester.**—Following the substitution of omnibuses for tramcars on the Manchester-Altrincham route, about fifty men in the Permanent Way Department of Manchester Corporation Transport Undertaking are, it is stated, to be discharged. The tramways manager has received suggestions from the officials of the union with a view to minimising the hardship of the decision.

**Twelve New Omnibuses to Run on Tees-side.**—A joint committee of Stockton and Middlesbrough Corporations has agreed that a service of omnibuses should be started as early as possible between Middlesbrough and Stockton Town Halls, also between the two towns along the Acklam route, the services to be operated jointly. Each Corporation is to purchase immediately six omnibuses to be used on these services.

**New Cars for Dundee.**—Members of Dundee Corporation Transport Committee on October 14 inspected in the Lochee-road depot a new tramcar which has been described as "the finest in Britain." Its cost will be £2,400. It accommodates 68 passengers, as compared with 54 in existing cars. The car is expected to be in service this week-end. Others of the type have been ordered to the specification of Mr. D. P. Morrison, the general manager. One feature is a larger platform at each end to facilitate loading and unloading. Electric heaters are provided in both saloons.

**Tramways Over a New Hull Bridge.**—Hull City Council has rejected an amendment to the Tramways Committee's recommendation for the tramways to be extended over the new North Bridge and the approach roads at an estimated cost, with overhead equipment, of £10,000. Alderman Stark said the Committee realised that some other form of transport would eventually have to be introduced, but £500,000 was still owing on the undertaking, and there were new lines on the routes with which the lines on the bridge would connect. More money had been granted by the undertaking in relief of rates than would have paid the loans.

**Improved Road Tars.**—An important development is taking place in the production of improved road tars, says the annual report of the Sheffield Highway and Sewerage Committee. The Yorkshire Tar Distillers offered for trial a number of specially prepared and blended tars, which have been applied on about forty lengths covering over eight miles of important roads. As far as can be judged at present after the summer's experience, some of these special tars are much superior to the ordinary standards. Many of the trial pieces, which have been subject to heavy traffic, present an excellent surface, which from the point of view of safety leaves nothing to be desired.

**Darlington's Omnibus Working Costs.**—At a meeting of Darlington Town Council, Alderman Sir C. W. Starmer, chairman of the Transport Committee, said that during the past year the Corporation vehicles had carried about 10,000,000 passengers, being 800,000 more than in any of the past four years and twice as many as six years ago. The revenue increase was only from £49,000 to £51,000, owing to the reduction in fares. The revenue per omnibus mile was 13.5d., and the working costs 9¾d. per omnibus mile, which he believed was the lowest in the country. The profit on the trolleybuses was £4,922, but there was a loss of £1,186 on the petrol omnibus services.

## CONTRACTS.

**Swansea Electricity Committee** has decided to purchase a motor tower wagon at a cost not exceeding £450.

**East Suffolk County Council** has accepted the tender of Siemens and General Electric Railway Signal Co. for five sets of automatic light control signals at £628.

**Portsmouth Tramways Committee** has accepted the tender of Samuel Salter (Portsmouth), Ltd., at £19,194, for the erection of administrative offices at Eastney.

**Bradford Tramways Committee** has recommended the tender of Mr. G. Charlesworth for making up uniforms for 1,412 men at £1,587, and for overcoats for 1,462 men at £1,061 10s.

**Bournemouth Corporation** has placed a repeat order for twelve Thornycroft six-cylinder express omnibuses with John I. Thornycroft & Co., Ltd. The Corporation already have twelve of these vehicles in service.

**Ransomes, Sims & Jefferies, Ltd.,** have an order for 25 saloon bodies for Green Line Coaches, Ltd., Westminster. These omnibuses will seat thirty passengers, all facing forward, and will have a front door and rear emergency exit.

**Glasgow Corporation** has ordered 25 "Emperor" double-deck omnibus chassis from the Vulcan Motor & Engineering Co. (1906), Ltd., Southport, and **Liverpool Corporation** has given an order for nine similar vehicles, the latter being a repeat order.

**The Associated Equipment Co., Ltd.,** has received the following orders for passenger vehicles: "Regent" double-deck, Thomas Tilling, Ltd. (62); "Regal" single-deck, W. Salisbury & Sons, Ltd. (6), F. J. Smith, Huddersfield Corporation (7), Rhondda Trams (6), Thos. Tilling, Ltd. (12). Overseas orders: Agar Cross and Co., Ltd., Buenos Aires, "Ranger" single-deck; Copenhagen Tramways, Denmark, "Renown" six-wheel double-deck. Many of the above are repeat orders.

**Cardiff Tramways and R.O.P. Oil.**—Cardiff Tramways Committee, on Monday, again considered the tender of Russian Oil Products for petrol, which had been referred back by the Council. The price quoted was 10⅜d. per gallon, which for the total of 75,000 gallons, was £1,577 below the next lowest combine tender and £9,194 less than for the same quantity last year. Labour members alleged that since the council meeting other contractors had quoted prices below those previously tendered. It was decided that for the next month the manager should purchase in the open market, and the question will be finally decided at the next meeting of the Committee.

**The English Electric Co.** is experiencing an increasing demand for Fullagar opposed-piston oil engine sets. The value of recent orders totals over £92,000, and no less than 42 per cent. of the total horse-power of Fullagar engines supplied by this company represents repeat orders. Recent contracts comprise: Karachi Electric Supply Corporation, 1,500 b.h.p. engine and tandem generators; the Admiralty, two 1,125 b.h.p. engines and 750 kw. D.C. generators; Delhi Electric Supply Co., 1,125 b.h.p. engine and 750 kw. A.C. generator; Dubbo (Australia), 750 b.h.p. engine and 500 kw. A.C. generator; Zanzibar (Crown Agents for the Colonies), 750 b.h.p. unit. Earlier in the year the following important orders, not included in the value given above, were received: Sudan Light & Power Co., 1,125 b.h.p. engine and alternator; Bermuda Electric Light, Power & Traction Co., Ltd., 1,500 b.h.p. engine and alternator. The manufacture of straight four-cycle Diesel engines, which has been carried on at the Rugby works of the company for the last twenty-three years, is still continued, and an order has recently been received from Colombo for a 335 b.h.p. unit, coupled to a 225 kw. generator.

## FINANCIAL.

**Shanghai Electric Construction Co.**—The directors have declared an interim dividend of 5 per cent. actual, tax free, on the issued share capital, payable November 1 next, on account of the year to December 31.

**Bournemouth Tramway Profits.**—At the October meeting of Bournemouth Town Council, it was reported that in the past twenty years the Corporation tramways and omnibuses had made a total net profit of £247,866. Of this £29,118 relieved the rates and the remainder was placed in renewals and reserve accounts.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended October 15 amounted to £83,964, a decrease of £836 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to October 15 (28 2-7 weeks) the total receipts were £2,341,368, a decrease of £20,642.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended September 27 gave total receipts of £425,329, or £1,543 less than in the corresponding week of last year. The aggregate receipts for twenty-six weeks amounted to £10,991,699, an increase of £114,147 over the corresponding period of last year.

**A.E.C. Increase Their Ordinary Shares.**—The directors of the Associated Equipment Co., Ltd., have decided to increase the capital to 1½ million pounds by the issue of 40,000 additional ordinary shares of £10 denomination per share. This increase of capital is necessitated by the development of A.E.C. business during the last twelve months, following the production of the extensive range of new chassis and to cover the cost of extension of the factory and new plant.

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**Norwich Electric Tramways Co.**—The net profit for the year ended June 30 last amounts to £24,180 (against £22,691), to which is added £1,908 brought forward, making a total of £26,088. From this total is deducted £6,600, being interim dividend of 2½ per cent. (subject to income tax), leaving a balance of £19,488, which the directors recommend should be appropriated by transfer to reserve fund of £12,500, and the payment of a final dividend of 2½ per cent. (subject to income tax), making 5 per cent. (same) for the year.

## BUSINESS NOTE.

**The Equipment and Engineering Co., Ltd.**, of 2 and 3, Norfolk-street, Strand, London, W.C.2, write to say that they have no connection with the Transport Equipment and Engineering Co., of Leeds. They add that Mr. A. F. Kellett, principal of the latter firm, was a representative of the Equipment and Engineering Co., Ltd., but severed his connection with them over twelve months ago.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. | Sept. 23 | 555 | 622 | + 67 | 25 | 14,548 | — 81 |
| „ Motor Buses | „ 23 | 233 | 329 | + 96 | 25 | 7,413 | + 1,372 |
| „ Total | „ 23 | 788 | 951 | + 163 | 25 | 21,961 | + 1,291 |
| Aberdeen Corp. | Oct. 8 | 4,427 | 4,960 | + 533 | 18½ | 103,978 | + 1,763 |
| Ashton-u-Lyne Corp. | „ 11 | 929 | 823 | — 106 | 28 | 23,881 | — 1,945 |
| „ Motor Buses | „ 11 | 475 | 471 | — 4 | 28 | 13,952 | + 138 |
| „ Trolley Buses | „ 11 | 296 | 252 | — 44 | 28 | 7,283 | — 548 |
| „ Total | „ 11 | 1,700 | 1,546 | — 154 | 28 | 45,216 | — 2,255 |
| Ayr Corporation | „ 11 | 469 | 430 | — 39 | 21 | 14,500 | — 1,177 |
| Barrow Corporation | „ 11 | 556 | 537 | — 19 | 28 | 16,440 | — 1,273 |
| „ Motor Buses | „ 11 | 409 | 379 | — 30 | 28 | 11,831 | + 617 |
| „ Total | „ 11 | 965 | 916 | — 49 | 28 | 28,271 | — 656 |
| Belfast City | „ 10 | 11,302 | 11,571 | + 269 | 27½ | 318,000 | + 9,556 |
| „ Motor Buses | „ 10 | 1,106 | 1,358 | + 252 | 27½ | 35,957 | + 7,340 |
| „ Total | „ 10 | 12,408 | 12,929 | + 521 | 27½ | 353,957 | + 16,896 |
| Birkenhead Corp. | „ 12 | 1,682 | 1,427 | — 255 | 28 | 43,059 | — 4,921 |
| „ Motor Buses | „ 12 | 3,311 | 4,046 | + 735 | 28 | 106,207 | + 56 |
| „ Total | „ 12 | 4,993 | 5,473 | + 480 | 28 | 149,266 | — 4,865 |
| Birmingham Corp. | „ 7 | 27,724 | 26,227 | — 1,497 | 27 | 706,974 | — 26,794 |
| „ Motor Buses | „ 7 | 13,827 | 16,564 | + 2,737 | 27 | 417,815 | + 66,800 |
| „ Trolley Buses | „ 7 | 574 | 535 | — 39 | 27 | 14,586 | — 295 |
| „ Total | „ 7 | 42,125 | 43,326 | + 1,201 | 27 | 1,139,375 | + 39,801 |
| Blackburn Corp. | „ 8 | 1,902 | 1,763 | — 139 | 27½ | 50,124 | — 4,617 |
| „ Motor Buses | „ 8 | Nil | 328 | + 328 | 27½ | 8,779 | + 8,779 |
| „ Total | „ 8 | 1,902 | 2,091 | + 189 | 27½ | 58,903 | + 4,162 |
| Bradford Corporation | „ 11 | 10,131 | 9,244 | — 887 | ... | ... | ... |
| „ Motor Buses | „ 11 | 3,250 | 3,128 | — 122 | ... | ... | ... |
| „ Trolley Buses | „ 11 | 1,071 | 1,939 | + 868 | ... | ... | ... |
| „ Miscellaneous | „ 11 | 1,421 | 1,402 | — 19 | ... | ... | ... |
| „ Total | „ 11 | 15,873 | 15,713 | — 160 | 28 | 399,389 | — 16,708 |
| Brighton Corporation | „ 12 | 2,579 | 2,375 | — 204 | 27½ | 81,383 | + 1,812 |
| Burnley Corporation | „ 13 | 3,042 | 2,796 | — 246 | — | ... | — |
| „ Motor Buses | „ 13 | 651 | 733 | + 82 | — | — | — |
| „ Total | „ 13 | 3,693 | 3,529 | — 164 | ... | .. | — |
| Burton-on-Trent Corp. | „ 12 | 819 | 929 | + 110 | 28 | 23,881 | + 876 |
| Bury Corporation | „ 12 | 2,019 | 1,586 | — 433 | 27½ | 49,854 | — 7,204 |
| „ Motor Buses | „ 12 | 741 | 1,415 | + 674 | 27½ | 32,719 | + 19,304 |
| „ Total | „ 12 | 2,760 | 3,001 | + 241 | 27½ | 82,573 | + 12,100 |
| Cardiff Corporation | „ 4 | 7,947 | 7,959 | + 12 | 26½ | 210,118 | + 1,570 |
| Chester Corporation | „ 12 | 430 | Nil | — 430 | 28 | Nil | — 12,469 |
| „ Motor Buses | „ 12 | Nil | 671 | + 671 | 28 | 18,781 | + 18,781 |
| „ Total | „ 12 | 430 | 671 | + 241 | 28 | 18,781 | + 6,312 |
| Chesterfield Corp. | „ 13 | 2,070 | 2,026 | — 44 | 28 | 54,217 | + 994 |
| Colchester Corp. | „ 15 | 562 | 604 | + 42 | 29 | 17,865 | + 1,819 |
| Colne Corporation | „ 15 | 704 | 697 | — 7 | 28 | 20,009 | — 470 |
| Coventry Corporation | „ 12 | 2,164 | 1,910 | — 254 | 28 | 55,301 | — 4,222 |
| „ Motor Buses | „ 12 | 1,704 | 1,751 | + 47 | 28 | 50,005 | + 5,643 |
| „ Total | „ 12 | 3,868 | 3,661 | — 207 | 28 | 105,306 | + 1,421 |
| Darlington Corp. | „ 11 | 999 | 1,021 | + 22 | 27½ | 29,586 | + 2,329 |
| Derby Corporation | „ 11 | 2,486 | 2,445 | — 41 | 28 | 68,465 | — 2,219 |
| „ Motor Buses | „ 11 | 806 | 958 | + 152 | 28 | 25,674 | + 5,292 |
| „ Total | „ 11 | 3,292 | 3,403 | + 111 | 28 | 94,139 | + 3,073 |
| Dover Corporation | „ 11 | 377 | 407 | + 30 | 28 | 12,638 | + 406 |
| Dundee Corporation | Sept. 30 | 2,695 | 2,430 | — 265 | 19½ | 50,582 | — 1,924 |
| „ Motor Buses | „ 30 | 863 | 1,222 | + 359 | 19½ | 22,385 | + 5,680 |
| „ Total | „ 30 | 3,558 | 3,652 | + 94 | 19½ | 72,967 | + 3,756 |
| East Ham Corp. | Oct. 11 | 2,481 | 2,387 | — 94 | 27½ | 64,188 | + 643 |
| Edinburgh Corp. | „ 4 | 15,695 | 15,411 | — 284 | 20½ | 307,076 | + 5,324 |
| „ Motor Buses | „ 4 | 3,620 | 3,797 | + 177 | 20½ | 77,998 | + 6,162 |
| „ Total | „ 4 | 19,315 | 19,208 | — 107 | 20½ | 385,074 | + 11,486 |
| Exeter Corporation | „ 15 | 916 | 777 | — 138 | 29 | 23,424 | — 2,088 |
| „ Motor Buses | „ 15 | 189 | 411 | + 221 | 29 | 9,582 | + 5,298 |
| „ Total | „ 15 | 1,105 | 1,188 | + 83 | 29 | 33,006 | + 3,210 |
| Glasgow Corporation | „ 11 | 47,099 | 45,117 | — 1,982 | 19 | 821,468 | — 3,470 |
| „ Motor Buses | „ 11 | 6,688 | 10,352 | + 3,664 | 19 | 162,997 | + 61,197 |
| „ Total | „ 11 | 53,787 | 55,469 | + 1,682 | 19 | 984,465 | + 57,727 |
| Gloucester Corp. | „ 8 | 660 | 802 | + 142 | 27½ | 19,813 | + 3,959 |
| Grimsby Corporation | „ 11 | 1,431 | 1,581 | + 150 | 28 | 45,137 | + 4,609 |
| Halifax Corporation | „ 7 | 4,572 | 5,253 | + 681 | 27½ | 141,152 | + 15,315 |
| Huddersfield Corp. | „ 11 | 6,554 | 6,561 | + 7 | 28 | 179,121 | — 2,021 |
| Hull Corporation | „ 11 | 8,007 | 6,282 | — 1,725 | 28 | 159,212 | — 6,097 |
| „ Motor Buses | „ 11 | 1,770 | 1,843 | + 73 | 28 | 44,608 | + 6,786 |
| „ Total | „ 11 | 9,777 | 8,125 | — 1,652 | 28 | 203,820 | + 689 |
| Ilford Corporation | „ 11 | 1,561 | 1,544 | — 17 | 27½ | 42,132 | + 195 |
| Ipswich Corp. Trol.Bus | „ 11 | 1,296 | 1,344 | + 48 | 27½ | 38,108 | + 2,027 |
| Isle of Thanet | „ 8 | 544 | 519 | — 25 | 40½ | 36,533 | — 4,425 |
| Kilmarnock Corp. | „ 11 | 490 | 514 | + 24 | 21½ | 10,551 | + 431 |
| Lancashire Un. | Sept. 28 | 2,394 | 2,151 | — 243 | 38½ | 82,525 | — 4,727 |
| „ Motor Buses | „ 28 | 5,074 | 5,176 | + 102 | 38½ | 192,816 | + 24,845 |
| Leeds Corporation | Oct. 11 | 19,684 | 19,923 | + 239 | 27½ | 555,566 | + 9,155 |
| Leicester Corp. | „ 11 | 8,789 | 8,631 | — 158 | 28 | 233,450 | + 108 |
| Lincoln Corp. | Sept. 14 | 966 | 1,002 | + 36 | 24 | 22,768 | + 76 |
| Liverpool Corp. | Oct. 11 | 27,154 | 26,728 | — 426 | 27½ | 747,072 | — 13,248 |
| „ Motor Buses | „ 11 | 2,868 | 3,184 | + 316 | 27½ | 92,156 | + 13,877 |
| „ Total | „ 11 | 30,022 | 29,912 | — 110 | 27½ | 839,228 | + 629 |
| London County Coun. | „ 15 | 84,800 | 83,964 | — 836 | 28½ | 2,341,368 | — 20,642 |
| Luton Corporation | „ 8 | 406 | 421 | + 15 | 27½ | 11,812 | + 285 |
| Maidstone Corp. | „ 9 | 171 | Nil | — 171 | 27½ | Nil | — 6,126 |
| „ Motor Buses | „ 9 | 365 | 290 | — 75 | 27½ | 7,786 | — 715 |
| „ Trolley Buses | „ 9 | 313 | 661 | + 348 | 27½ | 17,239 | + 8,609 |
| „ Total | „ 9 | 849 | 951 | + 102 | 27½ | 25,025 | + 1,768 |
| Manchester Corp. | „ 4 | 36,220 | 32,701 | — 3,519 | 27 | 861,123 | — 79,460 |
| „ Motor Buses | „ 4 | 4,980 | 9,070 | + 4,090 | 27 | 233,196 | + 98,544 |
| „ Total | „ 4 | 41,200 | 41,771 | + 571 | 27 | 1,094,319 | + 19,084 |
| Middlesbrough Corp. | „ 7 | 1,161 | 992 | — 169 | 27½ | 28,102 | — 2,998 |
| „ Motor Buses | „ 7 | 558 | 560 | + 2 | 27½ | 15,538 | + 1,165 |
| „ Total | „ 7 | 1,719 | 1,552 | — 167 | 27½ | 43,640 | — 1,833 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Tv.Corp. | Oct. 11 | 10,229 | 8,370 | — 1,859 | 27½ | 240,264 | — 41,044 |
| „ Motor Buses | „ 11 | 1,987 | 3,523 | + 1,536 | 27½ | 88,864 | + 31,382 |
| „ Total | „ 11 | 12,216 | 11,893 | — 323 | 27½ | 329,128 | — 9,662 |
| Newport Corporation | „ 4 | 1,765 | 1,180 | — 585 | 27 | 39,839 | — 5,229 |
| „ Motor Buses | „ 4 | 781 | 1,339 | + 558 | 27 | 25,432 | + 4,954 |
| „ Total | „ 4 | 2,546 | 2,519 | — 27 | 27 | 65,271 | — 275 |
| Northampton Corp. | „ 10 | 1,108 | 783 | — 325 | 27½ | 28,459 | — 2,411 |
| „ Motor Buses | „ 10 | 672 | 1,118 | + 446 | 27½ | 22,341 | + 3,716 |
| „ Total | „ 10 | 1,780 | 1,901 | + 121 | 27½ | 50,800 | + 1,305 |
| Nottingham Corp. | „ 9 | 7,689 | 6,893 | — 796 | 27½ | 159,285 | — 24,424 |
| „ Motor Buses | „ 9 | 2,974 | 4,109 | + 1,135 | 27½ | 92,957 | + 28,702 |
| „ Trolley Buses | „ 9 | 675 | 1,328 | + 653 | 27½ | 33,118 | + 16,814 |
| „ Total | „ 9 | 11,338 | 12,330 | + 992 | 27½ | 285,360 | + 21,092 |
| Oldham Corporation | „ 11 | 3,707 | 3,453 | — 254 | 29 | 96,861 | — 6,293 |
| „ Motor Buses | „ 11 | 1,921 | 1,908 | — 13 | 29 | 57,572 | — 1,037 |
| „ Total | „ 11 | 5,628 | 5,361 | — 267 | 29 | 154,433 | — 7,330 |
| Plymouth Corp. | „ 11 | 3,684 | 3,518 | — 166 | 27½ | 103,640 | — 4,465 |
| „ Motor Buses | „ 11 | 2,056 | 2,564 | + 508 | 27½ | 69,547 | + 14,956 |
| „ Total | „ 11 | 5,740 | 6,082 | + 342 | 27½ | 173,187 | + 10,491 |
| Portsmouth Corp. | „ 11 | 3,843 | 3,587 | — 256 | 28 | 124,872 | — 11,598 |
| „ Motor Buses | „ 11 | 1,805 | 3,015 | + 1,210 | 28 | 97,335 | + 37,452 |
| „ Total | „ 11 | 5,648 | 6,602 | + 954 | 28 | 222,207 | + 25,854 |
| Preston Corporation | „ 8 | 1,774 | 1,740 | — 34 | 27½ | 45,864 | — 2,172 |
| „ Motor Buses | „ 8 | 529 | 530 | + 1 | 27½ | 14,241 | + 723 |
| „ Total | „ 8 | 2,303 | 2,270 | — 33 | 27½ | 60,105 | — 1,449 |
| Rawtenstall Corp. | „ 12 | 858 | 651 | — 207 | 27½ | 18,051 | — 5,511 |
| „ Motor Buses | „ 12 | 516 | 695 | + 179 | 27½ | 19,486 | + 4,836 |
| „ Total | „ 12 | 1,374 | 1,346 | — 28 | 27½ | 37,537 | — 675 |
| Reading Corporation | „ 9 | 1,608 | 1,480 | — 128 | 28 | 40,048 | — 2,048 |
| „ Motor Buses | „ 9 | 933 | 1,047 | + 114 | 28 | 28,095 | + 2,585 |
| „ Total | „ 9 | 2,541 | 2,527 | — 14 | 28 | 68,143 | + 537 |
| Rochdale Corp. | „ 11 | 2,853 | 2,795 | — 58 | — | 76,916 | — 5,141 |
| „ Motor Buses | „ 11 | 1,543 | 1,583 | + 40 | — | 43,471 | — 664 |
| „ Total | „ 11 | 4,396 | 4,378 | — 18 | ... | 120,387 | — 4,477 |
| Rotherham Corp. | „ 13 | 2,752 | 2,725 | — 27 | 28 | 78,010 | + 1,956 |
| Salford Corporation | „ 12 | 11,409 | 11,101 | — 308 | 27½ | 310,754 | — 1,400 |
| Sheffield Corp. | „ 11 | 21,191 | 20,065 | — 1,126 | 26½ | 568,626 | — 19,220 |
| Southampton Corp. | „ 8 | 3,400 | 3,631 | + 231 | 28 | 97,446 | + 1,870 |
| „ Motor Buses | „ 8 | 858 | 903 | + 45 | 28 | 24,289 | + 2,658 |
| „ Total | „ 8 | 4,258 | 4,534 | + 276 | 28 | 121,735 | + 4,528 |
| Southend-on-Sea Corp. | „ 8 | 1,920 | 1,937 | + 17 | 27½ | 64,570 | — 3,425 |
| „ Trolley Buses | „ 8 | 218 | 274 | + 56 | 27½ | 9,313 | + 3,001 |
| „ Total | „ 8 | 2,138 | 2,211 | + 73 | 27½ | 73,883 | — 424 |
| Southport Corp. | „ 11 | 1,244 | 1,267 | + 23 | 27½ | 38,945 | — 789 |
| „ Motor Buses | „ 11 | 337 | 376 | + 39 | 27½ | 12,585 | + 1,065 |
| „ Total | „ 11 | 1,581 | 1,643 | + 62 | 27½ | 51,530 | + 276 |
| St. Helens Corp. | „ 7 | 1,984 | 2,090 | + 106 | 27 | 55,848 | + 2,852 |
| Sunderland Corp. | „ 14 | 2,327 | 2,156 | — 171 | 28 | 70,132 | + 95 |
| „ Motor Buses | „ 14 | 235 | 725 | + 490 | 28 | 16,988 | + 10,658 |
| „ Total | „ 14 | 2,562 | 2,881 | + 319 | 28 | 87,120 | + 10,753 |
| Swindon Corp. | „ 8 | 844 | 1,009 | + 165 | 27½ | 27,282 | + 5,228 |
| Wallasey Corp. | „ 11 | 1,238 | 1,192 | — 46 | 27½ | 35,340 | — 3,102 |
| „ Motor Buses | „ 11 | 1,765 | 2,053 | + 288 | 27½ | 67,969 | + 6,403 |
| „ Total | „ 11 | 3,003 | 3,245 | + 242 | 27½ | 103,309 | + 3,301 |
| Walsall Corporation | „ 5 | 3,511 | 3,847 | + 336 | 27 | 93,591 | + 1,394 |
| Walthamstow Corp. | „ 11 | 2,538 | 2,448 | — 90 | 27½ | 69,111 | — 514 |
| Warrington Corp. | „ 9 | 920 | 940 | + 20 | 28 | 24,844 | + 181 |
| „ Motor Buses | „ 9 | 488 | 540 | + 52 | 28 | 14,048 | + 1,560 |
| „ Total | „ 9 | 1,408 | 1,480 | + 72 | 28 | 38,892 | + 1,741 |
| West Ham Corp. | „ 9 | 6,418 | 6,142 | — 276 | 27½ | 165,986 | — 484 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses | „ 5 | 2,846 | 2,434 | — 412 | 27 | 66,341 | — 9,956 |
| „ Trolley Buses | „ 5 | 3,465 | 3,604 | + 139 | 27 | 93,878 | + 3,748 |
| „ Total | „ 5 | 6,311 | 6,038 | — 273 | 27 | 160,219 | — 6,208 |
| York Corporation | „ 8 | 1,035 | 1,009 | — 26 | 28 | 29,311 | — 475 |
| „ Motor Buses | „ 8 | 428 | 553 | + 125 | 28 | 14,353 | + 3,464 |
| „ Trolley Buses | „ 8 | 68 | Nil | — 68 | 28 | Nil | — 1,511 |
| „ Total | „ 8 | 1,531 | 1,562 | + 31 | 28 | 43,664 | + 1,478 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or *M* | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Oct. 14 | £86,695 | £81,793 | 41 w | £3,359,044 | — £174,792 |
| Brazilian Traction $ | Aug. | 4,333,460 | 3,792,808 | 8 *m* | 32,160,185 | — 546,195 |
| British Columbia $ | Aug. | 1,168,753 | 1,194,390 | 2 *m* | 2,390,629 | + 65,156 |
| Buenos Aires Lacroze | Oct. 12 | 11,798 | 11,611 | 15 w | 161,722 | — 11,802 |
| Burma E. Sup. Co. Rs. | Aug. | 61,309 | 66,418 | 12 *m* | 842,707 | — 11,962 |
| Calcutta ... Rs. | Oct. 11 | 132,577 | 91,262 | 40½ w | 4,508,132 | — 674,548 |
| Cape Town ... ... | Aug. | 27,636 | 24,690 | ... | ... | — |
| Carthagena & Herrerias | Sept. | 660 | 437 | 9 *m* | 7,292 | — 1,458 |
| Durban Corporation | Aug. | 25,619 | 25,071 | 1 *m* | 25,071 | — 548 |
| East India ... ... | Sept. | 4,126 | 3,731 | 2 *m* | 7,679 | — 599 |
| Kalgoorlie ... ... | July | 1,664 | 1,776 | 7 *m* | 11,662 | + 137 |
| Madras (2 weeks) Rs. | Oct. 15 | 46,623 | 50,006 | 40 w | 886,532 | + 49,226 |
| Para ... ... | Sept. | 15,200 | 12,196 | 10 *m* | 143,500 | — 5,026 |
| Port Elizabeth ... | Aug. | 7,402 | 6,955 | ... | ... | ... |
| Rangoon ... Rs. | Sept. | 122,850 | 147,775 | 9 *m* | 1,345,030 | + 267,189 |
| Shanghai ... $ | Sept. | 365,828 | 418,059 | 9 *m* | 3,097,758 | + 101,709 |
| Singapore ... ...$ | Sept. | 126,000 | 140,000 | 12 *m* | 1,650,000 | + 179,000 |
| Winnipeg ... ...$ | Aug. | 494,642 | 445,908 | 8 *m* | 4,171,624 | — 161,031 |

## RAILWAY RECEIPTS.

| 41st Week ended Oct. 12th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 215,000 | — 8,000 | 330,000 | — 22,000 | 545,000 | — 30,000 | -1,133,000 |
| L.M.S.R. | 509,000 | — 20,000 | 801,000 | — 83,000 | 1,310,000 | — 103,000 | -3,800,000 |
| L.N.E.R. | 335,000 | — 10,000 | 645,000 | — 61,000 | 980,000 | — 71,000 | -2,534,000 |
| S.R. | 292,000 | — 9,000 | 108,000 | — 3,000 | 400,000 | — 12,000 | — 486,000 |
| Totals | 1,351,000 | — 47,000 | 1,884,000 | — 169,000 | 3,235,000 | — 216,000 | -7,962,000 |

## ELECTRIC RAILWAYS.

| Name | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Oct. 11 | 293,400 | 310,400 | + 17,000 | 12,351,300 | + 644,800 |
| Lond. & Sub. Group | „ 11 | 44,000 | 45,800 | + 1,800 | 1,819,500 | + 101,500 |
| Metropolitan Railway | „ 11 | 36,900 | 35,900 | — 1,000 | 1,498,400 | + 16,200 |
| Liverpool Overhead | „ 12 | 1,667 | 1,331 | — 336 | 64,655 | — 5,179 |
| Mersey Railway ... | „ 11 | 4,720 | 4,631 | — 89 | 185,959 | + 3,991 |

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LONDON, OCTOBER 25, 1930.

## HULL TRAMWAYS MANAGEMENT.

At a time when, in the interests of municipal transport undertakings and of the public, there is a general desire to free the management from unwarranted interference by elected representatives, the decision of the Hull Town Council to ask the general manager of the tramways, Mr. E. S. Rayner, to resign, is regrettable. This is the climax to trouble of several years' standing, and follows a prolonged inquiry by the Tramways Committee into the administration of the department. Since the general strike of 1926, when volunteers continued the running of the transport system, the management has been subjected to continual interference which would have seriously crippled any private undertaking if it had been tolerated. The Labour members of the Council who are responsible for the decision on Tuesday are therefore not above suspicion of being actuated by personal animus and political considerations. They have decided against the decision of the Tramways Committee, which reported that the manager had answered the charges made against him to their satisfaction; and in face of the finding of Mr. W. H. Owen, a barrister, who had been retained by the Committee to make an examination of the 300-page report, that nothing was disclosed in the evidence to justify the undermining of public confidence in the undertaking or in the staff. "Instead of corruption," he finds, "the whole result was to present a vivid picture of well-intentioned, upright men, honestly working a great department." Alderman Stark's speech was a masterpiece of childishness. He indicted the manager on trivialities, and in one at least, that of advertising on the tickets, it was shown by the Sheriff, Councillor Till, that Alderman Stark was just as responsible as the manager. The Alderman's statement that he had warned the manager three years ago, eighteen months ago, and six months ago, and his refusal to give details on which Mr. Rayner might get evidence, reveals how the manager was badgered. Councillor Allderidge mentioned employees, not all in one grade, who were not loyal either to the undertaking or to their superiors, a statement confirmed by Councillor Oldfield, who said that nearly all the men who had given evidence were disgruntled. Mr. Rayner has evidently not had a fair chance, nor has he been given fair play. In the words of Councillor Woodliffe, there were too many managers. The result is not very creditable to Hull.

## REGENERATIVE CONTROL EQUIPMENT.

INTERNATIONAL TRAMWAYS UNION CONSIDERS THE SYSTEM.

At the Congress of the International Tramways and Light Railways Union at Warsaw in June last, M. L. Bacqueyrisse, Director-General of the "Société des Transports en Commun de la Région Parisienne," dealt with the subject of regenerative control on tramways. Much interest was taken in the discussion, and M. Mariage, vice-president of the Union, and chief of the S.T.C.R.P., at once offered to show to those interested in the question the results obtained by the S.T.C.R.P. with compound motors for regeneration such as have been designed by M. Bacqueyrisse. The invitation of M. Mariage was accepted, and a special meeting of the Union for the purpose of considering the regenerative system was held in Paris at the offices of the S.T.C.R.P. on October 21 and 22. Representatives attended from many countries. Among those present were a large number of representatives from this country, headed by Mr. R. Stuart Pilcher, president of the Municipal Tramways and Transport Association.

In opening the meeting, M. Mariage extended a cordial welcome to the delegates. M. F. de Lancker, president of the Union, replied, and M. Bacqueyrisse then read a paper (which had previously been circulated to members) on "Regenerative Control Equipment with Compound Motors of the S.T.C.R.P." The paper described the equipment and results obtained in actual working. The author claimed that a reduction of energy of from 25 to 30 per cent. was obtained.

The discussion on the paper was opened by Herr Mattersdorff, of the Hamburg Tramways, who said that the representatives of German tramway undertakings had been studying the operation of regenerative equipment in four cities, viz., Chemnitz, Nuremburg, Marseilles, and Paris, and had drawn up a report, which it was hoped shortly to publish. Herr Mattersdorff gave a brief account of the regenerative systems in use at Chemnitz and Nuremburg. He then presented several questions on the application of regenerative control. The first question was: "In view of the possibility of disconnection with the power line, e.g., displacement of the trolley, does the system need to be supplemented by an independent brake, either a compressed air brake or a rheostatic brake?"

M. Bacqueyrisse replied that the Paris cars fitted with regenerative control were also equipped with air brakes. In any case, the braking was not effective below a speed of six kilometres per hour. Therefore, once the car had been brought down to this speed, either by the regenerator or by the rheostatic brake, the air brakes were applied.

M. Zehnder, of the Montreux-Bernese Oberland Mountain Railway, expressed the view that auxiliary air braking was essential in the case of heavy trains of vehicles, both on railways and tramways. He remarked, however, that the experience of air brakes used alone had shown that brake shoes sometimes became heated to dangerous temperatures. M. Bacqueyrisse, referring to the question of the displacement of the trolley when a car is in motion, said that the most satisfactory solution had been found in the fitting of air brakes; but they were still looking for an adequate substitute which would obviate the high cost of providing and maintaining air brakes. In reply to another question, M. Bacqueyrisse said no difficulty was experienced in cutting off current in order to pass over a junction in the trolley wire. The controller handle could be brought back to zero in the ordinary way without entailing any braking effect.

Up to this point, the proceedings had been carried on in French and German, and in the meantime the British delegates had left the meeting in order to discuss the subject of the paper in a separate room. On their return, they were welcomed by the Chairman in the name of the Union. Mr. R. Stuart Pilcher briefly replied on behalf of the British delegation, and introduced Mr. G. H. Fletcher, of the Metropolitan Vickers Electrical Company, Limited, who presented a statement of the British delegates' conclusions on the paper.

Mr. Fletcher said that in the meeting they had had outside, he had tried to impress on his fellow delegates the necessity of putting out of their minds any prejudice created by the failure of the Raworth scheme. The improvements that had since been made in the design of motors, due chiefly to the introduction of interpoles and ventilation, made the scheme much more possible than it was sixteen years ago.

Since the war most of the tramway undertakings in England had improved their systems by the introduction of lightweight motors embodying the maximum gear ratio. They would, therefore, find it very difficult indeed to use the scheme of regeneration without purchasing new equipment, owing to the necessity for an increase in the weight of the motors. In the case of the Paris cars, it had been possible to obtain an increase of electrical output by increasing the speed of the motor 40-50 per cent. by the use, he believed, of double-reduction gearing. This could not be done in the case of the British tramways, which were now using the maximum possible gear ratio. They were now considering the question from another

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point of view, that is, how far they would be justified in purchasing new equipment, and that matter was still under investigation. In conclusion, Mr. Fletcher was of the opinion that any gain that might be obtained by reduction of the number of contacts would be counterbalanced by the increased weight of the commutator and collector gear.

M. Bacqueyrisse replied that on the Paris cars double reduction gear was already in use when the motors were rewired.

On adjournment, the delegates went on to the Hotel Continental for luncheon at the invitation of the S.T.C.R.P. M. Mariage presided, and over 200 delegates and other guests enjoyed the splendid hospitality of the Paris Transport Company. Cordial allusion was made to the presence of the British delegation, and Mr. R. Stuart Pilcher replied in a speech, which was warmly received, expressing the thanks of those who had crossed the Channel for the invitation that had been extended to them to see what was being done in Paris to extend and intensify the usefulness of tramways. In concluding his remarks, Mr. Pilcher made an impressive allusion to the sympathy extended by the people of France to Britain in the loss of those who were with R101, saying that the disaster would tend to strengthen the bonds of goodwill between the two nations.

Later in the afternoon tests were made on a section of the tramway route from the Louvre to Versailles with cars equipped with the regenerative control system. The cars were fitted with meters and recording instruments so that the action of the motors both when consuming and generating current could be followed as the cars proceeded. The change from one operation to the other was made with great frequency, and it was demonstrated that a considerable economy in the energy taken from the line was being effected. At the same time it was noticeable that a very heavy duty was being placed on the motors.

The British delegates left Paris on Wednesday morning, but the members of the Union went to Versailles to witness the operation of the regenerative control equipment of the Versailles Electric Tramways. Later, after luncheon at the Hotel des Reservoirs at the invitation of the Versailles Tramway Co., the members returned to the offices of the S.T.C.R.P. There the discussion adjourned on Tuesday was continued.

The large attendance at this special meeting of the Union indicates how greatly concerned members are to obtain information on the subject discussed, and whatever may be the result, the enterprise of the Paris Transport Co., in placing full details at the disposal of other undertakings is much appreciated.

## TRAMWAY MANAGERS JOURNEY BY 'BUS TO PARIS.

### A CROSSLEY 'BUS THE CENTRE OF INTEREST.

The party of municipal tramway representatives and others who attended the special meeting of the International Tramways and Light Railways Union in Paris this week returned well satisfied with their reception. They were also much impressed with the advantages that membership of the Union would confer on British tramways, and it may be hoped that there will soon be a considerable addition to the number of British members. The British delegation attended the meeting in response to the invitation of M. F. de Lancker, president of the Union, and at the suggestion of Mr. R. Stuart Pilcher, general manager of Manchester Corporation Transport, and president of the Municipal Tramways and Transport Association, the delegates travelled in an omnibus, which is shortly to be placed in the service of Manchester Corporation. The vehicle selected was a Crossley 50-seat double-deck omnibus similar to others already in service in that city. The omnibus left Manchester on Thursday, October 16, bringing a few delegates to London, and on Friday morning the entire party, numbering about 35 (whose names were given in our last issue), were picked up at the Waldorf Hotel. A start was made soon after seven and the omnibus proceeded to Dover, where it was shipped to Calais, whence the journey was continued to Amiens, where the night was spent at the Grand Hotel. On the following morning, the party went on to Beauvais, where they viewed the remains of the ill-fated R101. The journey was continued after luncheon, and the centre of Paris was reached about five o'clock.

The omnibus attracted much attention in the boulevards and streets, where the people are unaccustomed to double-deck vehicles, although many years ago there were in Paris some omnibuses of open top-covered type. The present omnibuses are all of the single-deck type, and are painted green, so that the Manchester omnibus, with its brilliant colouring of red, cream and gold, afforded a striking contrast with the vehicles with which the Parisians are familiar. During the stay of the delegates in Paris, the omnibus was used for transport to various places of interest, and wherever the vehicle appeared the public continued to manifest the greatest curiosity. The appearance of the vehicle gave rise to numerous articles in the Paris newspapers, some of which advocated the introduction of similar vehicles, although others maintained that the single-decked omnibus was better adapted to the conditions of traffic in Paris.

On Wednesday the party returned by railway to Calais, the omnibus having preceded them. It was ferried across the Channel as before, the transfer being rapidly and skilfully managed. At Dover the vehicle was quickly lifted on to the quay, and proceeded with the party to London, which was reached about 10 p.m. The performance of the Crossley 'bus throughout the journey was beyond praise. In speed and comfort it almost equalled a luxurious car.

## HULL MANAGER ASKED TO RESIGN.

Hull City Council on Tuesday considered a report of the Tramways Committee on the administration of the tramways department. The report, which extended to 300 printed pages, was the result of a long inquiry in the course of which it appears that the Committee were convinced that there was no ground for various charges that were made. At the final meeting, the Committee had passed a resolution stating that the general manager, Mr. E. S. Rayner, had answered the charges made against him to their satisfaction, and that in future he should be paid a suitable allowance, or an equivalent increase in salary, for the upkeep of his car.

An amendment by Alderman Stark (Labour) that the manager be asked to resign had not been seconded. The report recommended that Mr. B. J. E. Bruce, rolling stock superintendent, be superannuated or asked to resign, and that another official be asked to resign.

The town clerk read a statement prepared by Mr. W. H. Owen, barrister-at-law, who was engaged to examine the evidence, in which he said that he found that general charges against the undertaking and its staff were unfounded. There was, he said, no evidence to support the allegation that the place was rotten and seething with rottenness, and no evidence of corruption. Instead of corruption, " the whole result of the inquiry was to present a vivid picture of well-intentioned, upright men, honestly working a great department."

A long discussion on the Committee's report took place, and an amendment was moved by Councillor Schultz (Labour) that in view of the necessity for reorganisation of the department, the general manager be asked to tender his resignation. This amendment was carried by 33 votes to 14. An amendment that Mr. Bruce be required to tender his resignation was also carried.

To a representative of the " Hull Daily Mail," Mr. Rayner has said : " I am very satisfied to leave the public to judge the case on the information that has appeared before them in the Press, especially in view of the fact that counsel, who has acted as Judge in the County Court, and is a man well qualified to give an opinion, has so expressed his unqualified findings of the case."

## LONDON TRAFFIC UNIFICATION.

### L.C.C. REQUEST FOR FURTHER INFORMATION.

In a report presented to the London County Council on Tuesday last, which was adopted, the Special Committee on Traffic stated that on October 1, the Minister of Transport met representatives of local authorities owning tramways in the London Traffic Area, and invited them to attend a further conference, in order to discuss the proposals which the Government had formulated for the unification of London passenger traffic. The Committee were ready to accept the invitation, but they found themselves in some difficulty owing to the fact that the statement made by the Minister on October 1 (reported in THE TRAMWAY AND RAILWAY WORLD of October 4) provided little additional information as to the intentions of the Government to that contained in the announcement made in Parliament nearly a year ago. The Minister's statement should be amplified if the Council's representatives were to be able to take a useful part in the discussions. Sufficient indication should be given as to the broad lines to be followed, and the machinery to carry the proposal into effect. In particular, the Committee thought it desirable that information should be available as to the proposed constitution and method of appointment of the public body which the Government intended to set up and as to the means, if any, for securing that it should be receptive to public opinion or requirements. On the financial side, it appeared to be essential that the principles which would govern the valuation of the undertaking to be transferred to the new body should be outlined, and that information should be furnished as to the security and status of stock to be issued by the new body, if such a course be contemplated. The Committee had informed the Ministry of Transport that the Council would be pleased to appoint representatives to meet the Minister as suggested, but they asked that in the first instance information on the lines indicated should be supplied to the Council.

## PERSONAL.

**Mr. Samuel Gluckstein** has been appointed a member of the Special Committee of the London County Council on Traffic.

**Alderman William Eaton,** formerly for a considerable period chairman of Derby Corporation Tramways Committee, has resigned his seat on the Town Council.

**Mr. G. F. Cole** has been appointed chief engineer and manager of the Electric Supply Co. of Victoria, in succession to the late Mr. P. J. Pringle. For some years Mr. Cole has been the resident engineer in Bendigo.

**Mr. A. H. Hawkins,** managing director of the East Surrey Traction Co., has become operating manager of the Green Line Coaches, the London General Omnibus Company's subsidiary, comprising the East Surrey, the Autocar and the Green Line services. Mr. J. H. Rutland has been appointed assistant operating manager.

In memory of the late **Mr. Alfred Baker,** for many years manager of the Birmingham Corporation Tramways, £1,000 has been subscribed by the employees of the department and used to endow a cot in the Children's Hospital. The dedication of the cot will take place on October 27, when the Lord Mayor and members of the Tramways Committee will be present.

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## MISCELLANEOUS NEWS AND NOTES.

**The National Omnibus Co.** proposes to erect a new office and depot in Duke-street, Chelmsford.

**Manchester Transport Committee** has obtained sanction to borrow £39,200 for the purchase of 30 omnibuses.

**Depot Extension at Dundee.**—The tramway depot in Lochee-road, Dundee, is to be enlarged. Plans are being prepared by the city engineer.

**An Aberdeen Scrapping Decision.**—Aberdeen Tramways Committee having reaffirmed the recommendation to substitute omnibuses for tramways on the Ferryhill route, the Corporation has agreed.

**Trolleybuses Proposed for Scarborough.**—A Bill is to be promoted by Scarborough Corporation next session to secure powers to operate omnibus and trolleybus services, and to negotiate with other transport undertakings.

**Obsolete Omnibuses at Stoke.**—Owners of obsolete types of omnibuses at Stoke-on-Trent are to be informed by the Chief Constable that unless such vehicles are replaced, the Watch Committee will consider withdrawing the licences.

**Illuminations Swell Blackpool's Receipts.**—During September, when the Blackpool illuminations were in full swing, the tramcars carried 6,500,000 passengers, the receipts totalling £50,000. For the corresponding period in 1924, when there were no illuminations, there were less than 3,000,000 passengers, and under £20,000 in revenue.

**Keighley and the Offer to Buy.**—The West Yorkshire Road Car Co., Ltd., recently offered to purchase Keighley Corporation transport undertaking. It is understood that the question now under consideration is the formation of a joint board, which would eliminate wasteful competition and effect economies, without giving a monopoly.

**Trolleybuses Regain Passengers.**—In the report of the working of the George Town (Penang) municipal tramways during the year ended December 31 last, it is stated that £9,555 was expended on the purchase of trolleybuses. Mr. T. Rogers, the electrical engineer and manager, reports that the trolleybus extension to Jelutong was completed and a considerable number of passengers previously lost on this section had been regained.

**More Glasgow Omnibus Services.**—Glasgow Corporation Transport Committee is planning more omnibus services into Renfrewshire, including Giffnock, Busby, Clarkston, Mearnskirk, and Newton-Mearns. The King's Park services are also to be extended over the Lanarkshire boundary. Permission has been received from both county councils. Rutherglen and Clydebank have also given permission for the services to be extended to their areas.

**York Trolleybus Extension.**—At the meeting of York City Council to be held on November 10, a resolution will be submitted to make application to the Minister of Transport for a provisional order authorising the extension of the trolleybus route from the junction of Piccadilly with Pavement to the junction of Heslington-lane and Back-lane. Alderman W. Dobbie, chairman of the Tramways and Motors Committee, has stated that the tramways have only about ten more years to live.

**Maximum Fine at Hull.**—The Hull stipendiary magistrate on October 23 inflicted the maximum fine of 40s. or 28 days' imprisonment, with £3 3s. costs, on George Galley, of Newcastle, for permitting an omnibus of which he was the owner to be used as a hackney carriage to ply for hire without a licence. The vehicle was used in a service between Newcastle and Hull. Defendant had appealed to the Ministry of Transport against the refusal of Hull Watch Committee to grant him a licence, but the Ministry made no order.

**A Revised Standard Specification** for tungsten filament lamps has been issued by the British Engineering Standards Association, 28, Victoria-street, S.W.1. The increasing use of gas-filled lamps for lighting in trains and tramcars has necessitated the addition of schedules for the 100, 110, 120 and 130 volt 40 and 60 watt gas-filled traction lamp. The improvement of omnibus lighting equipment has resulted in the revision of the schedules for omnibus lamps, which are now universally rated at 12 volts instead of the old 14 volts.

**Lytham St. Annes Tramways.**—Referring to the loss of £6,712 on the tramways last year, the Mayor of Lytham St. Annes (Councillor A. J. Price) has said that if they scrapped the system they would still have to meet £11,000 a year for interest and sinking fund. Although omnibuses had proved more economical, tramcars had the advantage in carrying peak loads. The Council would consider the alternative of trolleybuses, and although that system did away with track expenses and was safer for passengers, it increased the cost of road upkeep.

**L.C.C. Tramway Matters.**—At the meeting of the London County Council on Tuesday last it was agreed that stores and material should be kept in the Tramways Department to the value of £229,000 during the current financial year. The General Purposes Committee reported having authorised Mr. R. E. S. Macintyre, assistant permanent way engineer for the southern system of tramways, to take out letters patent for an invention relating to street paving blocks, shaped and adapted for special purposes, subject to the provision that the Council shall be entitled to the use of the invention free from payment of royalty or other compensation. Sanction was given to the payment of £105 in respect of the Council's annual subscription to the Municipal Tramways and Transport Association, and of £100 in respect of the Council's annual subscription to the British Electrical and Allied Industries Research Association.

**The Position at Bradford.**—Mr. C. J. Spencer again visited Bradford last week-end to make further investigations into the position of the Corporation transport system. It is understood that Lord Ashfield has asked Mr. Spencer to give what assistance he can. It is suggested that by altering the hour of workmen's fares from 9 a.m. to 8 a.m., the revenue would be increased by £12,600 a year. For the period ending October 4, or 187 working days, the total receipts were £383,676, a decrease on the corresponding period of last year (188 days) of £16,548.

**Fog Lamps on London Tramcars.**—The London County Council Tramways Department has decided to fix fog lamps of an improved type to the 150 new cars now being delivered. This is the result of an experiment with fog lamps of 40 watts, fixed on a bracket on the dash of six cars, attached to a lead from the platform lamps. These fog lamps have reflectors of stainless steel or nickel chrome, thus increasing the intensity of the light. They proved satisfactory in last winter's fogs, and similar lamps will eventually be fixed to all the fleet. Their position will be at the side of the destination indicator, and they will be controlled by a two-way switch under the canopy, within reach of the motorman. With the lamp fixed at an angle of 45 degrees, the light will be thrown several yards in front of the car.

**Newcastle Men's Grievance.**—At Newcastle sixty men who were employed as relief drivers and conductors on the Corporation transport during the summer have been offered re-engagement at a lower rate of pay instead of being dismissed. Six hours of the day would be spent in the cleaning sheds, when they would be paid on the lower scale for that work; for the other two hours they would be on the vehicles, and paid the full rate for that time. The men, however, contend that they should be paid the higher rate for the whole of their time, and at a mass meeting their representatives were instructed to ask for terms within the present wages agreement. An official of the men's union has stated that it was not a question of terminating the engagement of holiday relief men, but of being called upon to work overtime while men were being thrown out of employment. The men were willing to forgo overtime rather than see anybody thrown out of work. A later report states that new terms have been offered by the management.

## FINANCIAL.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended October 22 amounted to £84,091, an increase of £360 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to October 22 (29 2-7 weeks) the total receipts were £2,425,862, a decrease of £20,586.

**Cardiff Corporation Tramways** made a net profit for the past financial year of £12,527, compared with £7,709 in the previous year. Receipts totalled £246,648, an average of 18.67d. per car mile, against £252,512, or 18.28d. per car mile. The decrease was due to a route now being served by omnibuses. Working expenses were £177,296, or 13.42d. per car mile. On the omnibuses there was a net deficit of £4,872, after meeting loan charges of £19,211. Income was £156,640, or 12.79d. per 'bus mile, the expenditure being £143,255, or 11.70d. per 'bus mile.

**Wellington (New Zealand) Corporation Tramways** report for the year ended March 31, shows revenue totalling £458,396 and working expenses £342,570, leaving a balance carried to net revenue account of £115,826, compared with £114,733 in the previous year. The renewal fund totals £68,414, and during the year £19,710 was spent on relaying track. Motor omnibus receipts were £20,151 and expenses £34,778, leaving a deficit of £14,627, after placing £7,662 to depreciation of omnibuses, which account stands at £30,827. On the whole undertaking there was a net surplus of £1,041, compared with £3,104 the previous year. Passengers on tramcars and omnibuses totalled 47,867,371, an increase of 815,438. The department has 212 tramcars and 29 omnibuses.

## CONTRACTS.

**The English Electric Co.** has a contract to supply switchgear to Barnsley Electricity Committee in connection with the grid scheme.

**Bradford Watch Committee** recommended the acceptance of the tender of Revo Electric Co., Ltd., for four sets of traffic signals at £600.

**Bury Corporation** has accepted tenders for four double-deck omnibuses—two Leyland, one Crossley, and one A.E.C. chassis, and four bodies from the Brush Electrical Engineering Co., Ltd.

**Liverpool Tramways Committee** has placed contracts as follows:—Edgar Allen & Co., special tramway trackwork; English Electric Co., 12 pairs of bogie trucks and 12 car sets of electro-pneumatic control gear.

**Halley Motors, Ltd.,** report that among orders received during the month of September is one from Glasgow Corporation for six of their two-ton chassis. These chassis will be fitted as tower wagons. Repeat orders have been received for a five-ton chassis from S. Alsopp & Sons, Ltd., of Burton, and for a 2½-ton chassis for Glico-Petroleum Co., Ltd.

**Aberdeen Town Council** were recommended by the Tramways Committee to place a contract for fourteen double-deck omnibus bodies with the Northern Counties Motor & Engineering Co., Wigan, at £675 per body. The tender of Mr. W. Walker, Aberdeen, was £750 each, or £1,050 more for the total. The recommendation was rejected in favour of an amendment that Mr. Walker's offer be accepted.

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**J. I. Thornycroft & Co., Ltd.,** have a repeat order from Bournemouth Corporation Tramways Department for twelve 32-seat omnibuses. The vehicles are to be used for express services, in extension of those which were inaugurated with twelve omnibuses in June last.

**Derby Transport Committee** has recommended that Austin cars be adopted as the standard car for the Corporation departments. They recommend the Council to make an agreement with the Dunlop Rubber Co., Ltd., for the maintenance of tyres in use on the Corporation's 'buses on a mileage basis.

**Glasgow Tramways Power Station.**—The Transport Committee has recommended acceptance of the following tenders: General Electric Co., Ltd., exciter switchgear and altering switchgear for Pinkston power station; Harland Engineering Co., Ltd., the English Electric Co., Ltd., and Crompton, Parkinson, Ltd., for rotary converters and switchgear.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | Oct. 21 | 735 | 585 | — 150 | 29 | 16,873 | — 310 |
| „ Motor Buses ... | „ 21 | 236 | 333 | + 97 | 29 | 8,690 | + 1,621 |
| „ Total ... ... | „ 21 | 971 | 918 | — 53 | 29 | 25,563 | + 1,311 |
| Aberdeen Corp. ... | „ 15 | 4,542 | 4,703 | + 161 | 19½ | 108,681 | + 1,924 |
| Ashton-u-Lyne Corp. | „ 11 | 929 | 823 | — 106 | 28 | 23,881 | — 1,945 |
| „ Motor Buses ... | „ 11 | 475 | 471 | — 4 | 28 | 13,952 | + 138 |
| „ Trolley Buses ... | „ 11 | 296 | 252 | — 44 | 28 | 7,283 | — 548 |
| „ Total ... ... | „ 11 | 1,700 | 1,546 | — 154 | 28 | 45,216 | — 2,255 |
| Ayr Corporation ... | „ 18 | 464 | 434 | — 30 | 22 | 14,935 | — 1,208 |
| Barrow Corporation... | „ 18 | 488 | 552 | + 64 | 29 | 16,992 | — 1,209 |
| „ Motor Buses ... | „ 18 | 380 | 375 | — 5 | 29 | 12,297 | + 613 |
| „ Total ... ... | „ 18 | 868 | 927 | + 59 | 29 | 29,199 | — 596 |
| Belfast City ... ... | „ 17 | 11,295 | 11,761 | + 466 | 28½ | 329,761 | + 10,022 |
| „ Motor Buses ... | „ 17 | 1,124 | 1,378 | + 254 | 28½ | 37,335 | + 7,594 |
| „ Total ... ... | „ 17 | 12,419 | 13,139 | + 720 | 28½ | 367,096 | + 17,616 |
| Birkenhead Corp. ... | „ 12 | 1,682 | 1,427 | — 255 | 28 | 43,059 | — 4,921 |
| „ Motor Buses ... | „ 12 | 3,311 | 4,046 | + 735 | 28 | 106,207 | — 56 |
| „ Total ... ... | „ 12 | 4,993 | 5,473 | + 480 | 28 | 149,266 | — 4,865 |
| Birmingham Corp. ... | „ 14 | 27,553 | 26,012 | — 1,541 | 28 | 732,986 | — 28,335 |
| „ Motor Buses ... | „ 14 | 13,751 | 16,524 | + 2,773 | 28 | 434,339 | + 69,662 |
| „ Trolley Buses ... | „ 14 | 571 | 529 | — 42 | 28 | 15,114 | — 337 |
| „ Total ... ... | „ 14 | 41,875 | 43,065 | + 1,190 | 28 | 1,182,439 | + 40,990 |
| Blackburn Corp. ... | „ 15 | 1,961 | 1,716 | — 245 | 28½ | 51,840 | — 4,877 |
| „ Motor Buses ... | „ 15 | Nil | 325 | + 325 | 28½ | 9,104 | + 9,104 |
| „ Total ... ... | „ 15 | 1,961 | 2,041 | + 80 | 28½ | 60,944 | + 4,227 |
| Bradford Corporation | „ 18 | 10,193 | 9,126 | — 1,067 | ... | ... | ... |
| „ Motor Buses ... | „ 18 | 3,289 | 3,050 | — 239 | ... | ... | ... |
| „ Trolley Buses ... | „ 18 | 1,064 | 1,946 | + 882 | ... | ... | ... |
| „ Miscellaneous ... | „ 18 | 386 | 247 | — 139 | ... | ... | ... |
| „ Total ... ... | „ 18 | 14,932 | 14,369 | — 563 | 29 | 413,758 | — 17,271 |
| Brighton Corporation | „ 19 | 2,346 | 2,396 | + 50 | 27½ | 83,779 | + 1,862 |
| Burnley Corporation... | „ 13 | 3,042 | 2,796 | — 246 | — | ... | — |
| „ Motor Buses ... | „ 13 | 651 | 733 | + 82 | — | ... | — |
| „ Total ... ... | „ 13 | 3,693 | 3,529 | — 164 | ... | ... | — |
| Burton-on-Trent Corp. | „ 19 | 824 | 891 | + 67 | 29 | 23,948 | + 943 |
| Bury Corporation ... | „ 19 | 1,939 | 1,601 | — 338 | 28½ | 51,455 | — 7,543 |
| „ Motor Buses ... | „ 19 | 705 | 1,422 | + 717 | 28½ | 34,141 | + 20,022 |
| „ Total ... ... | „ 19 | 2,644 | 3,023 | + 379 | 28½ | 85,596 | + 12,479 |
| Cardiff Corporation ... | „ 18 | 7,516 | 7,720 | + 204 | 28½ | 225,580 | + 1,913 |
| Chester Corporation ... | „ 19 | 414 | Nil | — 414 | 29 | Nil | — 12,883 |
| „ Motor Buses ... | „ 19 | Nil | 660 | + 660 | 29 | 19,441 | + 19,441 |
| „ Total ... ... | „ 19 | 414 | 660 | + 246 | 29 | 19,441 | + 6,558 |
| Chesterfield Corp. ... | „ 20 | 2,014 | 2,012 | — 2 | 29 | 56,229 | + 992 |
| Colchester Corp. ... | „ 22 | 524 | 586 | + 62 | 30 | 18,451 | + 1,875 |
| Colne Corporation ... | „ 22 | 674 | 708 | — 34 | 29 | 20,717 | — 436 |
| Coventry Corporation | „ 19 | 2,133 | 1,567 | — 566 | 29 | 56,868 | — 4,788 |
| „ Motor Buses ... | „ 19 | 1,669 | 1,802 | + 133 | 29 | 51,807 | + 5,776 |
| „ Total ... ... | „ 19 | 3,802 | 3,369 | — 433 | 29 | 108,675 | + 988 |
| Darlington Corp. ... | „ 18 | 992 | 1,064 | + 72 | 28½ | 30,651 | + 2,401 |
| Derby Corporation ... | „ 18 | 2,551 | 2,420 | — 131 | 29 | 70,885 | — 2,350 |
| „ Motor Buses ... | „ 18 | 803 | 940 | + 137 | 29 | 26,614 | + 5,430 |
| „ Total ... ... | „ 18 | 3,354 | 3,360 | + 6 | 29 | 97,499 | + 3,080 |
| Dover Corporation ... | „ 18 | 384 | 401 | + 17 | 29 | 13,010 | + 423 |
| Dundee Corporation... | „ 7 | 2,581 | 2,604 | + 23 | 20½ | 53,186 | — 1,901 |
| „ Motor Buses ... | „ 7 | 859 | 1,204 | + 345 | 20½ | 23,590 | + 6,026 |
| „ Total ... ... | „ 7 | 3,440 | 3,808 | + 368 | 20½ | 76,776 | + 4,125 |
| East Ham Corp. ... | „ 18 | 2,356 | 2,307 | — 49 | 28½ | 66,496 | + 650 |
| Edinburgh Corp. ... | „ 11 | 14,389 | 14,482 | + 93 | 21½ | 321,558 | + 5,417 |
| „ Motor Buses ... | „ 11 | 3,419 | 3,661 | + 242 | 21½ | 81,658 | + 6,404 |
| „ Total ... ... | „ 11 | 17,808 | 18,143 | + 335 | 21½ | 403,216 | + 11,821 |
| Exeter Corporation ... | „ 22 | 823 | 757 | — 65 | 30 | 24,182 | — 2,153 |
| „ Motor Buses ... | „ 22 | 185 | 413 | + 227 | 30 | 9,905 | + 5,526 |
| „ Total .. ... | „ 22 | 1,008 | 1,170 | + 162 | 30 | 34,177 | + 3,373 |
| Glasgow Corporation... | „ 11 | 47,099 | 45,117 | — 1,982 | 19 | 821,468 | — 3,470 |
| „ Motor Buses ... | „ 11 | 6,688 | 10,352 | + 3,664 | 19 | 162,997 | + 61,197 |
| „ Total ... ... | „ 11 | 53,787 | 55,469 | + 1,682 | 19 | 984,465 | + 57,727 |
| Gloucester Corp. ... | „ 15 | 625 | 715 | + 90 | 28½ | 20,527 | + 4,049 |
| Grimsby Corporation | „ 18 | 1,403 | 1,588 | + 185 | 29 | 46,726 | + 4,793 |
| Halifax Corporation | „ 14 | 4,667 | 5,182 | + 515 | 28½ | 146,334 | + 15,830 |
| Huddersfield Corp. ... | „ 18 | 6,319 | 6,428 | + 109 | 29 | 185,549 | — 1,912 |
| Hull Corporation ... | „ 18 | 8,142 | 7,361 | — 781 | 29 | 166,573 | — 6,878 |
| „ Motor Buses ... | „ 18 | 1,768 | 2,125 | + 357 | 29 | 46,734 | + 7,144 |
| „ Total ... ... | „ 18 | 9,910 | 9,486 | — 424 | 29 | 213,307 | + 266 |
| Ilford Corporation ... | „ 18 | 1,508 | 1,558 | + 50 | 28½ | 43,691 | + 550 |
| Ipswich Corp. Trol.Bus | „ 18 | 1,287 | 1,376 | + 89 | 28½ | 39,491 | + 2,116 |
| Isle of Thanet ... | „ 15 | 518 | 459 | — 59 | 41½ | 36,992 | — 4,484 |
| Kilmarnock Corp. ... | „ 18 | 470 | 527 | + 57 | 22½ | 11,079 | + 489 |
| Lancashire Un. ... | „ 12 | 2,373 | 2,153 | — 220 | 40½ | 88,844 | — 5,155 |
| „ Motor Buses ... | „ 12 | 4,919 | 5,247 | + 328 | 40½ | 203,311 | + 25,449 |
| Leeds Corporation ... | „ 18 | 19,852 | 19,902 | + 50 | 28½ | 575,469 | + 9,170 |
| Leicester Corp. ... | „ 18 | 8,636 | 8,568 | — 68 | 29 | 242,018 | — 53 |
| Lincoln Corp. ... | Sept. 14 | 966 | 1,002 | + 36 | 24 | 22,768 | + 76 |
| Liverpool Corp. ... | Oct. 18 | 27,415 | 26,742 | — 673 | 28½ | 773,814 | — 13,922 |
| „ Motor Buses ... | „ 18 | 2,980 | 3,189 | + 209 | 28½ | 95,346 | + 14,086 |
| „ Total ... ... | „ 18 | 30,395 | 29,931 | — 464 | 28½ | 869,160 | + 164 |
| London County Coun. | „ 22 | 83,731 | 84,091 | + 360 | 29½ | 2,425,862 | — 20,586 |
| Luton Corporation ... | „ 15 | 411 | 396 | — 15 | 28½ | 12,208 | + 270 |
| Maidstone Corp. ... | „ 16 | 168 | Nil | — 168 | 28½ | Nil | — 6,293 |
| „ Motor Buses ... | „ 16 | 351 | 268 | — 83 | 28½ | 8,054 | — 797 |
| „ Trolley Buses ... | „ 16 | 300 | 574 | + 274 | 28½ | 17,813 | + 8,882 |
| „ Total ... ... | „ 16 | 819 | 842 | + 23 | 28½ | 25,867 | + 1,792 |
| Manchester Corp. ... | „ 18 | 35,796 | 32,708 | — 2,998 | 29 | 926,545 | — 85,307 |
| „ Motor Buses ... | „ 18 | 4,830 | 9,097 | + 4,267 | 29 | 251,261 | + 106,977 |
| „ Total ... ... | „ 18 | 40,626 | 41,895 | + 1,269 | 29 | 1,177,806 | + 21,580 |
| Middlesbrough Corp. | „ 14 | 1,172 | 1,015 | — 157 | 28½ | 20,117 | — 3,155 |
| „ Motor Buses ... | „ 14 | 531 | 545 | + 14 | 28½ | 16,083 | + 1,179 |
| „ Total ... ... | „ 14 | 1,703 | 1,560 | — 143 | 28½ | 45,200 | — 1,976 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty. Corp. | Oct. 18 | 10,209 | 8,381 | — 1,828 | 28½ | 248,645 | — 42,872 |
| „ Motor Buses ... | „ 18 | 2,002 | 3,597 | + 1,595 | 28½ | 92,461 | + 32,976 |
| „ Total ... ... | „ 18 | 12,211 | 11,978 | — 233 | 28½ | 341,106 | — 9,896 |
| Newport Corporation | „ 11 | 1,675 | 1,203 | — 472 | 28 | 41,042 | — 5,701 |
| „ Motor Buses ... | „ 11 | 769 | 1,367 | + 598 | 28 | 26,799 | + 5,552 |
| „ Total ... ... | „ 11 | 2,444 | 2,570 | + 126 | 28 | 67,841 | — 149 |
| Northampton Corp. ... | „ 17 | 1,127 | 754 | — 373 | 28½ | 29,213 | — 2,784 |
| „ Motor Buses ... | „ 17 | 686 | 1,053 | + 367 | 28½ | 23,395 | + 4,083 |
| „ Total ... ... | „ 17 | 1,813 | 1,807 | — 6 | 28½ | 52,608 | + 1,299 |
| Nottingham Corp. ... | „ 16 | 6,653 | 5,806 | — 847 | 28½ | 165,091 | — 25,271 |
| „ Motor Buses ... | „ 16 | 2,726 | 3,605 | + 879 | 28½ | 96,563 | + 29,582 |
| „ Trolley Buses ... | „ 16 | 658 | 1,222 | + 564 | 28½ | 34,340 | + 17,378 |
| „ Total ... ... | „ 16 | 10,037 | 10,633 | + 596 | 28½ | 295,994 | + 21,689 |
| Oldham Corporation | „ 18 | 3,629 | 3,348 | — 281 | 30 | 100,209 | — 6,573 |
| „ Motor Buses ... | „ 18 | 1,956 | 1,926 | — 30 | 30 | 59,498 | — 1,056 |
| „ Total ... ... | „ 18 | 5,585 | 5,274 | — 311 | 30 | 159,707 | — 7,639 |
| Plymouth Corp. ... | „ 18 | 3,707 | 3,430 | — 277 | 28½ | 107,071 | — 4,740 |
| „ Motor Buses ... | „ 18 | 2,038 | 2,517 | + 479 | 28½ | 72,064 | + 15,434 |
| „ Total ... ... | „ 18 | 5,745 | 5,947 | + 202 | 28½ | 179,135 | + 10,694 |
| Portsmouth Corp. ... | „ 18 | 3,955 | 3,524 | — 431 | 29 | 128,396 | — 12,030 |
| „ Motor Buses ... | „ 18 | 1,821 | 2,905 | + 1,084 | 29 | 100,240 | + 38,535 |
| „ Total ... ... | „ 18 | 5,776 | 6,429 | + 653 | 29 | 228,636 | + 26,505 |
| Preston Corporation... | „ 15 | 1,738 | 1,752 | + 14 | 28½ | 47,617 | — 2,158 |
| „ Motor Buses ... | „ 15 | 530 | 550 | + 20 | 28½ | 14,792 | + 743 |
| „ Total ... ... | „ 15 | 2,268 | 2,302 | — 34 | 28½ | 62,409 | — 1,415 |
| Rawtenstall Corp. ... | „ 19 | 839 | 650 | — 189 | 28½ | 18,701 | — 5,700 |
| „ Motor Buses ... | „ 19 | 521 | 691 | + 170 | 28½ | 20,178 | + 5,006 |
| „ Total ... ... | „ 19 | 1,360 | 1,341 | — 19 | 28½ | 38,879 | — 694 |
| Reading Corporation | „ 16 | 1,534 | 1,451 | — 83 | 29 | 41,499 | — 2,140 |
| „ Motor Buses ... | „ 16 | 898 | 1,026 | + 128 | 29 | 29,121 | + 2,714 |
| „ Total ... ... | „ 16 | 2,432 | 2,477 | + 45 | 29 | 70,620 | + 574 |
| Rochdale Corp. ... | „ 18 | 2,848 | 2,750 | — 98 | — | 79,666 | — 5,240 |
| „ Motor Buses ... | „ 18 | 1,541 | 1,617 | + 76 | — | 45,089 | — 587 |
| „ Total ... ... | „ 18 | 4,389 | 4,367 | — 22 | ... | 124,755 | — 4,653 |
| Rotherham Corp. ... | „ 20 | 2,667 | 2,813 | — 146 | 29 | 89,823 | + 2,102 |
| Salford Corporation ... | „ 19 | 11,304 | 11,438 | + 134 | 28½ | 322,193 | — 1,358 |
| Sheffield Corp. ... | „ 18 | 21,317 | 20,290 | — 1,027 | 27½ | 588,916 | — 20,247 |
| Southampton Corp. ... | „ 15 | 3,406 | 3,524 | + 118 | 29 | 109,970 | + 1,986 |
| „ Motor Buses ... | „ 15 | 850 | 905 | + 55 | 29 | 25,194 | + 2,714 |
| „ Total ... ... | „ 15 | 4,256 | 4,429 | + 173 | 29 | 128,164 | + 4,700 |
| Southend-on-Sea Corp. | „ 22 | 1,848 | 1,883 | + 35 | 29½ | 68,300 | — 3,483 |
| „ Trolley Buses ... | „ 22 | 203 | 262 | + 59 | 29½ | 9,831 | + 3,094 |
| „ Total ... ... | „ 22 | 2,051 | 2,145 | + 94 | 29½ | 78,131 | — 389 |
| Southport Corp. ... | „ 18 | 1,208 | 1,265 | + 57 | 28½ | 40,210 | — 732 |
| „ Motor Buses ... | „ 18 | 325 | 373 | + 48 | 28½ | 12,958 | + 1,113 |
| „ Total ... ... | „ 18 | 1,533 | 1,638 | + 105 | 28½ | 53,168 | + 381 |
| St. Helens Corp. ... | „ 14 | 2,037 | 2,025 | — 12 | 28½ | 57,873 | + 2,840 |
| Sunderland Corp. ... | „ 21 | 2,376 | 2,122 | — 254 | 29 | 72,254 | + 159 |
| „ Motor Buses ... | „ 21 | 238 | 713 | + 475 | 29 | 17,702 | + 11,134 |
| „ Total ... ... | „ 21 | 2,614 | 2,835 | + 221 | 29 | 89,956 | + 10,975 |
| Swindon Corp. ... | „ 15 | 831 | 991 | + 160 | 28½ | 28,273 | + 5,388 |
| Wallasey Corp. ... | „ 18 | 1,255 | 1,165 | — 90 | 28½ | 36,505 | — 3,192 |
| „ Motor Buses ... | „ 18 | 1,902 | 2,094 | + 192 | 28½ | 70,033 | + 6,595 |
| „ Total ... ... | „ 18 | 3,157 | 3,259 | + 102 | 28½ | 106,568 | + 3,403 |
| Walsall Corporation... | „ 12 | 3,518 | 3,786 | + 268 | 28 | 97,377 | + 1,662 |
| Walthamstow Corp. ... | „ 11 | 2,538 | 2,448 | — 90 | 27½ | 69,111 | — 514 |
| Warrington Corp. ... | „ 16 | 907 | 902 | — 5 | 29 | 25,746 | + 176 |
| „ Motor Buses ... | „ 16 | 466 | 512 | + 46 | 29 | 14,560 | + 1,606 |
| „ Total ... ... | „ 16 | 1,373 | 1,414 | + 41 | 29 | 40,306 | + 1,782 |
| West Ham Corp. ... | „ 16 | 6,320 | 6,091 | — 229 | 28½ | 172,077 | — 714 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | „ 12 | 2,763 | 2,455 | — 308 | 28 | 68,797 | — 10,263 |
| „ Trolley Buses ... | „ 12 | 3,452 | 3,465 | + 13 | 28 | 97,343 | + 3,761 |
| „ Total ... ... | „ 12 | 6,215 | 5,920 | — 295 | 28 | 166,140 | — 6,502 |
| York Corporation ... | „ 15 | 1,045 | 976 | — 69 | 29 | 30,287 | — 544 |
| „ Motor Buses ... | „ 15 | 423 | 516 | + 93 | 29 | 14,870 | + 3,556 |
| „ Trolley Buses ... | „ 15 | 64 | Nil | — 64 | 29 | Nil | — 1,574 |
| „ Total ... ... | „ 15 | 1,532 | 1,492 | — 40 | 29 | 45,157 | + 1,438 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Wks. or *M* | Aggregate. 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Oct. 21 | £87,614 | £80,696 | 42 w | £3,439,740 | — £181,710 |
| Brazilian Traction $ | Sept. | 4,225,416 | 3,906,162 | 9 m | 36,036,347 | — 865,449 |
| British Columbia $ | Aug. | 1,168,753 | 1,194,390 | 2 m | 2,390,629 | + 65,156 |
| Buenos Aires Lacroze | Oct. 19 | 11,716 | 11,349 | 16 w | 173,071 | — 12,169 |
| Burma E. Sup. Co. Rs. | Sept. | 59,467 | 65,852 | 2 m | 132,270 | + 11,494 |
| Calcutta ... Rs. | Oct. 18 | 110,754 | 94,215 | 41½ w | 4,602,347 | — 691,087 |
| Cape Town ... ... | Sept. | 26,579 | 24,295 | ... | ... | .. |
| Carthagena & Herrerias | Sept. | 660 | 437 | 9 m | 7,292 | — 1,458 |
| Durban Corporation | Aug. | 25,619 | 25,071 | 1 m | 25,071 | — 548 |
| East India ... ... | Sept. | 4,126 | 3,731 | 2 m | 7,679 | — 599 |
| Kalgoorlie ... ... | July | 1,664 | 1,776 | 7 m | 11,662 | + 137 |
| Madras (2 weeks) Rs. | Oct. 15 | 46,623 | 50,006 | 40 w | 886,532 | + 49,226 |
| Para ... ... | Sept. | 15,200 | 12,196 | 10 m | 143,500 | — 5,026 |
| Port Elizabeth ... | Sept. | 7,190 | 6,670 | ... | ... | ... |
| Rangoon ... Rs. | Sept. | 122,850 | 147,775 | 9 m | 1,345,030 | + 267,189 |
| Shanghai ... $ | Sept. | 365,828 | 418,059 | 9 m | 3,097,758 | + 101,709 |
| Singapore ... $ | Sept. | 126,000 | 140,000 | 12 m | 1,650,000 | + 179,000 |
| Winnipeg ... $ | Aug. | 494,642 | 445,908 | 8 m | 4,171,624 | — 161,031 |

## RAILWAY RECEIPTS.

| 42nd Week ended Oct. 19th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 206,000 | — 10,000 | 337,000 | — 11,000 | 543,000 | — 21,000 | -1,154,000 |
| L.M.S.R. | 502,000 | — 20,000 | 790,000 | — 93,000 | 1,292,000 | — 113,000 | -3,922,000 |
| L.N.E.R. | 328,000 | — 5,000 | 656,000 | — 76,000 | 984,000 | — 81,000 | -2,615,000 |
| S.R. | 282,000 | — 6,000 | 112,000 | — 3,000 | 394,000 | — 9,000 | — 495,000 |
| Totals | 1,318,000 | — 41,000 | 1,895,000 | — 183,000 | 3,213,000 | — 224,000 | -8,186,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Oct. 18 | 297,600 | 312,400 | + 14,800 | 12,663,700 | + 659,600 |
| Lond. & Sub. Group | „ 18 | 44,500 | 46,600 | + 2,100 | 1,866,100 | + 103,600 |
| Metropolitan Railway | „ 18 | 36,800 | 35,600 | — 1,200 | 1,534,000 | + 15,000 |
| Liverpool Overhead | „ 19 | 1,633 | 1,361 | — 272 | 66,016 | — 5,451 |
| Mersey Railway ... | „ 18 | 4,577 | 4,500 | — 77 | 190,459 | + 3,914 |

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LONDON, NOVEMBER 1, 1930.

## LONDON'S NEW OMNIBUSES.

The new construction programme of the London General Omnibus Company, details of which are given in another column, provides for the introduction within the next six months of 1,300 omnibuses of the latest types. Of these 800 are to be of the "ST" pattern, a quick loading vehicle which the company has found an unqualified success in handling peak hour traffic at congested points; the other 500 are of the "LT" type, a six-wheel vehicle designed primarily for outlying routes where higher speeds are possible than can be attained in streets of dense traffic. Decisions to build omnibuses on such a wholesale scale are not arrived at without exhaustive research, experiment and trial, both in the shops and under actual traffic conditions; and these having been carried out, the company have evidently decided that the two types mentioned are the very best so far evolved for dealing with London passenger traffic. From the point of view of the public they provide the refinements of a private car, and no more comfortable, smoother riding vehicle can now be found in public service. Particularly is this true of the "ST" type with its luxurious seating accommodation, roomy platform and inside staircase which protects passengers from the weather when ascending and descending. The provision of the inside staircase in the new six-wheel omnibuses, which the company are considering, would still further improve the "LT" type and be very acceptable to the public. By February next a sufficient number of the new vehicles will be on the streets to replace all the old "K" solid tyred type. In due course, under the Road Traffic Act, solid tyres will have to disappear in any case, and the passing of the "K" omnibus will hasten their demise, although after that it will take some time to replace the intermediate types which are still shod with solid tyres. This new building programme will bring London into line with other parts of the country, where the more recently established services, on a comparatively small scale, are operated by the latest productions of motor engineers and coachbuilders. It is no light task to keep a fleet of 4,600 omnibuses up to date, and it can only be done by a company with enormous resources. When the building contract runs into hundreds of vehicles a time comes when some of these are not as up to date as they might be, compared with the more recent types which appear in the natural course of manufacturing evolution. The London General, however, have never been lacking in enterprise, and have, in spite of great difficulties, maintained a high standard of vehicle and service in catering for London's traffic needs.

## MEMORIAL TO MR. ALFRED BAKER.

A COT ENDOWED IN BIRMINGHAM CHILDREN'S HOSPITAL.

The Alfred Baker Memorial Cot in the Children's Hospital, Birmingham, which has been endowed by the employees of the Corporation Tramways and Omnibus Department as a tribute to the late Mr. Alfred Baker, who was for 25 years general manager of the department, was unveiled on October 27, in the presence of a large company. Mr. J. McDonnell, assistant general manager, spoke of the movement leading up to the endowment of the cot, and said that every member of the staff had shared in the scheme, each man contributing 1d. a week for 52 weeks. He referred to the relationship that existed between the staff and their grand old chief, whose influence, he said, was unique even among the men with whom he never came into personal contact.

The Lord Mayor, Alderman M. L. Lancaster, presented the cheque endowing the cot to Alderman A. H. James, who is vice-president of the hospital and also chairman of the Transport Committee. The Lord Mayor said that he regarded it as wonderful that the staff of 6,000 had contributed £1,050 for the cot. The affection in which the late Mr. Baker was held extended through every department of the Corporation. Alderman James, in a tribute to the late Mr. Baker, said that Birmingham little realised its indebtedness to his foresight and ability.

Mr. Arthur C. Baker, eldest son of the late Mr. Baker, now general manager of the department, in expressing the appreciation of the family of the memorial, said that nothing could have given his father greater pleasure than that cot; for all his life he loved little children, and many of his actions were governed by the thought of what the consequences would be to children.

Motorman Tilling, speaking on behalf of his colleagues, said that the late Mr. Baker always thought of the difficulties of the workers as well as of the interests of the department.

## INSTITUTION OF AUTOMOBILE ENGINEERS.

IMPORTANT PAPERS TO BE READ.

Two important contributions to the literature of road transport will be presented at a joint meeting of the Institution of Automobile Engineers, the Institute of Transport and the Commercial Motor Users' Association on Monday, November 10, at 7 p.m., at the Institution of Electrical Engineers, Victoria Embankment. Mr. G. J. Shave, chief engineer and operating manager of the London General Omnibus Co., will read a paper entitled "Passenger-Carrying Vehicles," whilst Mr. C. le M. Gosselin, president of the C.M.U.A., will deal with "Goods-Carrying Vehicles." Mr. Shave and Mr. Gosselin will also read their papers on the following night, Tuesday, November 11, at a meeting of the Institution of Automobile Engineers at the King's Head Hotel, Coventry, at 7.30 p.m.

SKIDDING RESEARCH.

In conjunction with the Ministry of Transport, the National Physical Laboratory has been carrying out researches into the question of rubber-tyred vehicles on roads, and the results of some of these researches are given in two papers which are to be read before various centres of the Institution of Automobile Engineers, namely, "Some Experiments on the Factors Affecting the Motion of a Four-Wheel Vehicle when some of its Wheels are Locked," by J. Bradley and S. A. Wood, and "Factors Affecting the Behaviour of Rubber-Tyred Wheels on Road Surfaces," by J. Bradley and R. F. Allen.

These papers will be read in the following centres: Bristol, Thursday, November 6, at the Merchant Venturers' Technical College, 7 p.m.; Glasgow, Monday, November 24, at the Institute of Engineers and Shipbuilders, Elmbank-crescent, 7.30 p.m.; London, Tuesday, December 2, at the Royal Society of Arts, John-street, Adelphi, 7.45 p.m.

A further paper of interest is that of Mr. A. H. Girling, entitled "A New Automobile Braking System." Mr. Girling will read his paper at Bristol on November 6, and also at a meeting of the North-Eastern Centre at the Metropole Hotel, Leeds, on Wednesday, November 19, at 7.15 p.m.

**Glasgow Omnibus Agreement.**—At a meeting of Glasgow magistrates on October 22 the chief constable stated that he had made a provisional arrangement with the representatives of the principal omnibus companies. The agreement provides for the erection of large stations at Waterloo-street and Killermont-street, which will be used for the arrival and departure of privately-owned omnibuses. These stations are intended to relieve the congestion at the stances in Carlton-place and Cathedral-street. The magistrates agreed to recommend the proposals to the Corporation.

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## A.E.C. HEAVY OIL ENGINE FOR ROAD SERVICE.

The Associated Equipment Company held an exhibition and demonstration of their high-speed heavy-oil engine at their works at Southall on Thursday last. This engine, which employs the "Acro" system of compression-ignition, is now in production, and is the result of two years' intensive research work. Four of these production models were on view, together with working models of a Bosch fuel pump and injection system, which carefully regulates the quantity of oil injected. A cross-sectional model of a cylinder showed clearly the design and method of working of the "Acro" head. The engine is not a remodelled petrol engine, but has been designed afresh throughout to meet the entirely different requirements of this type of power unit. Unlike other oil engines, the A.E.C. is governed down, not up. Its minimum number of revolutions per minute is 300 and the maximum in the neighbourhood of 3,000. The engine, which is rated at 95 h.p., is interchangeable with the corresponding A.E.C. six-cylinder petrol engine for commercial chassis.

Demonstrations were given on the road with the oil engine mounted in a double-decked omnibus and proved conclusively that it is now commercially practicable. The performance is equal to that of a petrol engine, the vehicle being capable of a speed of between 45 and 50 m.p.h. At slow speeds, however, there is more noise than with the petrol engine. This disadvantage will doubtless be eliminated after further experiment, but it is, in any case, outweighed by the great saving in running costs which the system effects. Consumption tests carried out on a lorry during a period of some months gave 9.7 miles per gallon as against 5 miles per gallon for the petrol engine doing exactly the same work in the same chassis. Since the cost of fuel oil is about one-third that of petrol, the fuel cost of the oil engine is in the neighbourhood of one-sixth that of the corresponding petrol engine.

## L.G.O.C. CONSTRUCTION PROGRAMME.

1,300 NEW OMNIBUSES BY APRIL.

Under the new construction programme of the London General Omnibus Company, the K type solid-tyred open-top omnibuses, which were introduced in 1919, will all have been withdrawn from service by February next and replaced by the ST and LT types.

The ST is the new double-deck top-covered omnibus with inside staircase, seating 50 passengers, introduced at the beginning of this year, which has proved an unqualified success for handling peak hour traffic at congested points. The programme provides for 800 of these. The LT is the six-wheel vehicle with covered top, seating 54 passengers. This was introduced in August of last year. The building programme includes 500 of this type, and the fitting of them with an inside staircase like the ST is under consideration.

The new vehicles are now being produced at the rate of ten per week, and later twenty per week will be put into service, replacing the K vehicles. By the end of April, 1931, it is expected that all of the 1,300 new-type ST and LT will be in service. The full fleet comprises 4,600 omnibuses. In addition to these two types, there are in service 3,300 intermediate types between the K and ST and LT. These include the NS top-covered pattern which has been in service since 1923, 50 of the T type (the "Regal" single deck) and twelve of the LS six-wheel experimental omnibus seating 66 passengers. The single-deck vehicles are, of course, operated on special routes and will be continued, but after April the NS type will be gradually superseded by the ST and LT. In effect, there will thus be three standard types with the gradual elimination of one, unless the company, in the interim, evolve some other pattern.

The LT vehicle was described and illustrated in THE TRAMWAY AND RAILWAY WORLD of August 15, 1929, and the ST in the issue of February 13, 1930.

## LIVERPOOL REFUSES TO APPOINT OMNIBUS MANAGER.

At a meeting of the Liverpool City Council on October 22 a report of the Tramways Committee, rejecting a proposal for the appointment of an omnibus manager, was approved by a large majority. Mr. R. Edwards, defending the policy of the Committee, declared that if there had been any Corporation official who had been unfairly treated it was the general manager of the tramways, Mr. P. Priestley, who had never been given the chance of putting into operation his views regarding omnibuses.

Sir Thomas White declared that the tramways manager had not advocated the purchase of omnibuses, which certain speakers had condemned; he had been overridden. It could not be too strongly insisted that omnibuses could never be made to pay while tramways were run at the present low fares, and no one had the temerity to propose any increase in tramway fares.

In the course of a long discussion, Mr. F. C. Wilson, chairman of the Tramways Committee, quoted figures showing that omnibus fares in Liverpool were lower than those in Merseyside and other boroughs, and yet those other boroughs could not make their omnibuses pay. Omnibuses, when run against tramways, would always be run at a loss. Mr. Wilson cited a list of charges that had to be set against the revenue from omnibuses and concluded with an allusion to "those 'bus engineers who are trying to kid us that they can run 'buses at a profit."

**New M.E.T. Cars.**—Middlesex County Council agreed on October 30 to the purchase by the Metropolitan Electric Tramways, Ltd., of 54 new cars. The cars will cost about £3,000 each. The company propose to extend their depot at Finchley.

## TRAMCARS' RIGHT-OF-WAY.

SEQUEL TO COLLISION ON THE THAMES EMBANKMENT.

Sir Chartres Biron at Bow-street Police Court on October 30 dismissed the summons against T. H. Murphy, an L.C.C. tramcar driver, for failing to bring his car to a standstill to avoid impending danger. Mr. E. F. Barker, for the police, said that the driver of a motor coach in turning his vehicle on the Embankment went on to the tramway track. An approaching tramcar crashed into the motor coach before the coach had completed the turn. The prosecution claimed that the driver of the car had ample time to pull up.

Sir Chartres Biron asked whether these motor coaches had any right on the tramlines at all. Mr. Barker rejoined that, in turning, they would have to go on them sometimes. Sir Chartres: That is because they are of such enormous length. Mr. Barker added that, so far as he was aware, there was no objection to any vehicle going on to the tramlines.

The driver of the motor coach said that when he drove on the tracks there was a tramcar 30 yards away, travelling towards him at 20 miles an hour, but he naturally expected the tramcar to stop.

The magistrate, in dismissing the summons, said that tramcars were public vehicles and had a right-of-way on the tramway lines. Drivers of other vehicles who wished to make use of the track must take proper care and precaution. It was clear that no offence had been made out.

## L.C.C. TRAMWAY MATTERS.

LEYTON TRAMWAYS AGREEMENT.

At the meeting of the London County Council on Tuesday, a supplementary agreement with Leyton Corporation Tramways was approved. In June, 1921, the Council entered into an agreement with Leyton providing for the working of the Leyton tramways as part of the L.C.C. system, and in May, 1930, the agreement was extended for a period of 25 years, until June 30, 1956. The L.C.C. has agreed to pay Leyton 75 per cent. of the share of the surplus on working, while Leyton will pay 75 per cent. of its share in any loss.

PROVISION OF CAR TRAVERSERS.

Five of the tramcar traversers installed in certain of the car sheds require replacing at an early date. Two at New Cross were installed in 1903, and three in 1905, the outstanding debt amounting to £1,240. The cost of installing five new traversers is estimated at £6,000. The Highways Committee recommended that, in view of the special character of the appliances, tenders for the supply of the traversers should be invited from selected firms.

## PERSONAL.

**Sir Ernest Clark,** a director of the Underground Group of railways and the London General Omnibus Co., has been elected a director of Messrs. Harland & Wolff, shipbuilders and engineers.

**Mr. S. B. Jackson,** of the North Metropolitan Electric Power Supply Company, has been appointed regional control engineer of the South-East England scheme of the Central Electricity Board.

**Mr. M. V. Everton,** London manager for the Lamp Sales Department of Metropolitan Vickers Electrical Company, Ltd., has been appointed sales manager for that department at the headquarters of the company at Bush House.

**Mr. Fred Bland** has been elected unopposed as a member of Sheffield City Council for the ensuing three years. Mr. Bland sits as Conservative member for Ecclesall. Only three members, including Mr. Bland, were returned unopposed.

**Mr. A. McD. Gordon** has been appointed to represent the London County Council on the Railway Assessment Authority. This body has been set up by the Minister of Health under the Railways (Valuation for Rating) Act, which received the Royal Assent in July last.

**Mr. J. L. Gunn,** general manager of Aberdeen Corporation Tramways and Motors, presided over a social gathering of employees and their friends when presents were handed to three men with long service who were retiring. Motorman M. Steven had twenty-eight years' service, Mr. J. Pirie, car cleaner, seventeen years, and Motorman R. Smith fifteen years.

## FINANCIAL.

**Rhondda Tramways Co.**—The directors announce that at an early date they will submit certain proposals for the consideration of debenture holders. The half-yearly interest on the 5 per cent. first mortgage debentures, due on October 1, was paid on October 22.

At a meeting of shareholders of the **South Staffordshire Tramways Co., Ltd.,** held in London on October 23, it was decided to wind up the company, the properties having been taken over by local municipalities. Mr. C. W. Francis and Mr. T. H. Underhill, of 88, Kingsway, London, W.C., were appointed joint liquidators.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended October 29 amounted to £82,872, a decrease of £1,742 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to October 29 (30 2-7 weeks) the total receipts were £2,508,697, a decrease of £23,072.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended October 11 gave total receipts of £425,169, or £1,801 more than in the corresponding week of last year. The aggregate receipts for twenty-eight weeks amounted to £11,848,449, an increase of £118,685 over the corresponding period of last year.

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## MISCELLANEOUS NEWS AND NOTES.

**Fire in Rawtenstall Depot.**—A fire which occurred in Rawtenstall Corporation tramcar depot caused damage to seven cars estimated at £4,000.

**Tyre Prices Raised in the United States.**—A Reuter message states that nearly all the important tyre manufacturers in the United States have raised their prices by 2½ to 5 per cent.

**Tramcars as Park Shelters.**—Belfast Tramways Department recently advertised that they had 25 tramcars for sale. No replies having been received, the Committee has offered them to the Parks Committee for use as shelters.

**Omnibuses on the Manchester-Altrincham Route.**—On Sunday the new service of omnibuses which is to replace the tramcars from Manchester to Altrincham will be inaugurated. Double-deck vehicles will be used as a temporary provision, and for the present the tramway service will be maintained.

**Road Traffic Act Delay.**—The first sections of the new Road Traffic Act dealing with the physical fitness of drivers and reckless or dangerous driving will not come into force to-day (Saturday), as was originally intended. The Ministry of Transport hopes that it will be possible for the regulations to become operative on December 1, but a further postponement is not improbable.

**Newcastle Tramways Settlement.**—The terms offered by Newcastle Tramways Management to avoid the dismissal of sixty-four men who became redundant after the summer holidays have been accepted. The arrangement provides that the men affected will come within the Tramway Tribunal rate of wages and ensures them a guaranteed 44-hour week and overtime, which will give them 48 hours.

**Manchester and Diesel Omnibuses.**—Mr. R. Stuart Pilcher, general manager of the Manchester Corporation Transport, has stated that the department will introduce vehicles fitted with Diesel engines driven by crude oil. The Corporation are now paying 1s. per gallon for petrol, which Mr. Pilcher states gives only five miles to the gallon with the present omnibuses. Using crude oil, costing only 5d. a gallon, he estimates that an equally capacious omnibus will run 15 miles to the gallon.

**Short Time Working at Bolton.**—An agreement has been reached between Bolton Transport Committee and its employees over the short time rendered necessary by the curtailment of the service. Men working spread-over duty are to be paid for not less than eight hours, and short-time working as a whole is to take the amended form of one full day off at intervals, instead of two or more hours each day. Thus the men will work the usual 48-hour week for three weeks, and a 40-hour week for the fourth week.

**Sunday Tramcars at Colwyn Bay.**—A Sunday service of tramcars is to start at Colwyn Bay on November 9, and will include a through service to Llandudno. Hitherto the company's agreement with the Council prevented the running of cars on Sundays, but following a recent vote of the ratepayers in favour of a limited service of omnibuses on Sundays and the doubling of the track on the reconstructed Conway-road, the Council has waived this part of the agreement. The decision is subject to revision in twelve months.

**Glasgow Traffic Increase.**—At a meeting of Glasgow Transport Committee on October 29 figures were submitted showing a remarkable increase in the revenue from the tramways and omnibuses for the period June 1 to October 25. The total receipts amounted to £1,127,015, a net increase of £57,896 over the same period of last year. Passengers carried by the combined service increased by 10,250,000, of which the largest proportion was omnibus passengers. The increase was mainly due to the extension of the omnibus services to the housing and other outlying areas.

**Belfast's New Car.**—The first of Belfast's new cars has been delivered and will shortly be put into service. The remaining 49 cars on order are to follow at intervals. The new cars are of the totally-enclosed type and seat 68 persons, and the upper saloon will be electrically heated. The cars are upholstered in leather and have transverse seats in both upper and lower saloons. They are equipped with two motors of 58 h.p. each. The cars have roller bearings, and all moving parts of the truck will be fitted with a grease-gun system similar to that provided in motor cars. Air brakes are fitted which, in an emergency, may be applied by the conductor.

**Brighton's Proposed Transport Board.**—The town clerk of Brighton has issued a report upon the Bill which is to be promoted to constitute a transport board for Brighton and Hove, and to provide for the transfer of the tramways and omnibus undertakings. The Bill contains provisions for giving effect to the agreements made between Brighton and Hove Corporations and Thos. Tilling, Ltd. Provision is made for co-ordination with the Southdown Motor Services and with the Southern Railway. The latter will have power to require the former company to convey passengers from and to points outside a radius of two and a half miles from the station to connect with specified trains.

**New Trolleybus Routes at Wolverhampton.**—On October 27 two additional trolleybus routes were put into service on the Wolverhampton Corporation system. One is between Bilston and the Fighting Cocks, a distance of 1·578 miles, and the other between Bilston and Willenhall, just over two miles in length. Both routes are being operated with double-deck top-covered Guy trolleybuses, fitted with Rees-Stevens motors equipped for regenerative control. Until a few years ago these sections were served by tramcars operated by Wolverhampton and District Tramways Co., which were subsequently taken over by Wolverhampton Corporation when the service of motor omnibuses was provided in place of the tramways.

**Suggested Omnibus Centre for Manchester.**—The Manchester Corporation Transport Committee decided on Tuesday to approach the Improvements Committee with a suggestion that Parker-street, which runs between Portland-street and Mosley-street, should be widened for the purpose of providing a motor omnibus centre for the city.

**Railway Wages.**—The railway companies, acting together, have invited the Railway Trade Unions to meet their general managers and representatives immediately after the present truce agreement expires on November 12, to consider the present position of the railways. The total traffic decrease since January 1 has amounted to over £8,000,000, and the companies are convinced that immediate steps must be taken further to reduce expenditure.

**Hull Tramways Management.**—Notice of a motion to rescind the resolution passed at a special meeting of the Hull City Council, calling for the resignation of the general manager, has been given by Councillor J. G. Hewett. The resolution will be considered at the November meeting of the Council, and, in the meantime, the operation of the resolution is automatically suspended. For the benefit of Hull tramway undertaking, and in justice to an able and conscientious official, who has efficiently served the Corporation under exceedingly difficult conditions, it may be hoped that the Council will cancel its ill-advised resolution.

**Coventry New Cars Proposal Referred Back.**—On Tuesday, Coventry Corporation, by 24 votes to 23, referred back a recommendation by the Transport Committee to purchase five new tramcars. Opponents of the proposal expressed a preference for omnibuses. In reply, Councillor O. M. Flinn, chairman of the Committee, stated that if all the cars were replaced by omnibuses at least another £20,000 would be added per annum to interest and sinking fund payments, bringing the total to £61,000 a year. All large towns were buying new cars, which showed that they did not regard them as obsolete. Nothing would please him better than to have a poll taken on the question of tramways versus omnibuses.

**Bradford Tramways.**—In an election speech for an anti-Labour candidate at Bradford, Councillor W. Hodgson, vice-chairman of the Tramways Committee, said the suggestions which Mr. C. J. Spencer proposed to put before the Reorganisation Sub-Committee would bring a return to prosperity within eighteen months; the success of Mr. Spencer's work in a similar advisory capacity in Athens, Alexandria and Cairo gave plenty of scope for this view. Councillor H. Hudson, speaking at the adoption of a Liberal candidate, said that in the past he had made many hard statements about the late tramways manager, Mr. R. H. Wilkinson. He had since discovered, however, that Mr. Wilkinson had never been allowed to manage the department. When Mr. Spencer issued his report on the tramways situation many people would find it an "eye-opener."

**Combined Rail and Road Coach.**—It was reported some time ago that the L.M.S. Railway Company were experimenting with a combined rail and road motor coach. It is now stated that the company propose to test this vehicle both on the railway and the road near London. In appearance and size the coach resembles an ordinary motor coach, but it has two sets of wheels. One of these is fitted with pneumatic tyres for use on the road and the other with steel tyres similar to those on a railway coach. It has machinery for raising and lowering the two sets of wheels. The device recalls a tramcar used in Brussels many years ago which was fitted with flanged wheels for use on the tramway and other wheels for use on the roadway. The object of the L.M.S. is to secure a vehicle capable of picking up passengers on the roads and then proceeding with them to the railway so that passengers may be able to travel from their homes to their destinations in one vehicle. An official of the company stated that the coach has been designed largely to compete with ordinary motor coaches.

## CONTRACTS.

**Edinburgh Tramways Committee** is obtaining tenders for 20 single-deck omnibuses and a motor lorry.

**Hull Tramways Committee** has purchased four Dennis omnibuses at £1,587 each and four Leyland omnibuses at £1,650 each.

**Yorkshire Switchgear & Engineering Co., Ltd.**
ELECTRICAL AND TRAMWAY ENGINEERS
OVERHEAD LINE MATERIALS AND SUPPLIES.
Sole Manufacturers of
TURNER'S PATENT AUTOMATIC POINT CONTROLLERS.
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Telephone: City 3014. Telegrams: "Tramsuplim, Cannon, London."

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**Edgar Allen & Co., Ltd.,** have an order from Liverpool Corporation for tramway trackwork at £880.

**"Nesta," Ltd.,** of "Nesta" Works, Brunswick-square, High-road, London, N.17, have an order for the seats for the upper and lower saloons of fifty of the cars that the Brush Electrical Engineering Co. are building for the Leeds Corporation.

**Glasgow Transport Committee** has accepted the following tenders: Copper Bonds—Thomas Bolton & Sons, Ltd.; Special Trackwork—Edgar Allen & Co., Ltd., Hadfields, Ltd., and Titan Trackwork Co., Ltd.; Band Saw Grazing Machine—T. White & Sons.

**Liverpool Tramways Committee** has accepted the tender of the English Electric Co., Ltd., for twelve pairs of equal wheel bogie trucks, with flexible driving shafts, each bogie fitted with one DK 120 motor (£1,700 per pair), and 12 car sets of electro-pneumatic control gear at £365 per car set.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return 1929 | Latest Return 1930 | + or − | Aggregate Wks | Aggregate 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. | Oct. 28 | 561 | 758 | + 197 | 30 | 17,631 | — 113 |
| „ Motor Buses | „ 28 | 257 | 208 | + 51 | 30 | 8,998 | + 1,672 |
| „ Total | „ 28 | 818 | 1,066 | + 248 | 30 | 26,629 | + 1,559 |
| Aberdeen Corp. | „ 22 | 4,362 | 4,562 | + 260 | 20½ | 113,274 | + 2,185 |
| Ashton-u-Lyne Corp. | „ 18 | 926 | 825 | — 101 | 29 | 24,705 | — 2,046 |
| „ Motor Buses | „ 18 | 474 | 478 | + 4 | 29 | 14,431 | + 142 |
| „ Trolley Buses | „ 18 | 290 | 254 | — 36 | 29 | 7,537 | — 584 |
| „ Total | „ 18 | 1,690 | 1,557 | — 133 | 29 | 45,673 | — 2,488 |
| Ayr Corporation | „ 25 | 430 | 414 | — 16 | 23 | 15,349 | — 1,224 |
| Barrow Corporation | „ 25 | 493 | 552 | + 59 | 30 | 17,545 | — 1,150 |
| „ Motor Buses | „ 25 | 358 | 380 | + 22 | 30 | 12,587 | + 636 |
| „ Total | „ 25 | 851 | 932 | + 81 | 30 | 30,132 | — 514 |
| Belfast City | „ 24 | 11,161 | 11,568 | + 407 | 29½ | 341,329 | + 10,429 |
| „ Motor Buses | „ 24 | 1,111 | 1,385 | + 274 | 29½ | 38,720 | + 7,858 |
| „ Total | „ 24 | 12,272 | 12,953 | + 681 | 29½ | 380,049 | + 18,297 |
| Birkenhead Corp. | „ 26 | 1,633 | 1,377 | — 256 | 30 | 45,838 | — 5,422 |
| „ Motor Buses | „ 26 | 3,155 | 3,753 | + 598 | 30 | 113,789 | + 1,337 |
| „ Total | „ 26 | 4,788 | 5,130 | + 342 | 30 | 159,657 | — 4,085 |
| Birmingham Corp. | „ 21 | 27,633 | 26,436 | — 1,197 | 29 | 759,422 | — 29,533 |
| „ Motor Buses | „ 21 | 13,900 | 16,788 | + 2,888 | 29 | 451,127 | + 72,550 |
| „ Trolley Buses | „ 21 | 565 | 533 | — 32 | 29 | 15,648 | — 369 |
| „ Total | „ 21 | 42,098 | 43,757 | + 1,659 | 29 | 1,226,197 | + 42,648 |
| Blackburn Corp. | „ 22 | 1,816 | 1,749 | — 67 | 29½ | 53,589 | — 4,941 |
| „ Motor Buses | „ 22 | Nil | 329 | + 329 | 29½ | 9,433 | + 9,433 |
| „ Total | „ 22 | 1,816 | 2,078 | + 262 | 29½ | 63,022 | + 4,492 |
| Bradford Corporation | „ 25 | 9,999 | 9,156 | — 843 | ... | ... | ... |
| „ Motor Buses | „ 25 | 3,380 | 3,161 | — 219 | ... | ... | ... |
| „ Trolley Buses | „ 25 | 1,039 | 1,964 | + 925 | ... | ... | ... |
| „ Miscellaneous | „ 25 | 874 | 882 | + 8 | ... | ... | ... |
| „ Total | „ 25 | 15,292 | 15,163 | — 129 | 30 | 428,921 | — 17,400 |
| Brighton Corporation | „ 26 | 2,313 | 2,242 | — 71 | 29½ | 86,020 | + 1,791 |
| Burnley Corporation | „ 25 | 2,930 | 2,638 | — 292 | ... | ... | ... |
| „ Motor Buses | „ 25 | 637 | 704 | + 67 | ... | ... | ... |
| „ Total | „ 25 | 3,567 | 3,342 | — 225 | ... | ... | ... |
| Burton-on-Trent Corp. | „ 19 | 824 | 891 | + 67 | 29 | 23,948 | + 943 |
| Bury Corporation | „ 26 | 1,922 | 1,607 | — 315 | 29½ | 53,063 | — 7,857 |
| „ Motor Buses | „ 26 | 730 | 1,423 | + 693 | 29½ | 35,563 | + 20,714 |
| „ Total | „ 26 | 2,652 | 3,030 | + 378 | 29½ | 88,626 | + 12,857 |
| Cardiff Corporation | „ 25 | 7,476 | 7,691 | + 215 | 29½ | 233,271 | + 2,127 |
| Chester Corporation | „ 26 | 410 | Nil | — 410 | 30 | Nil | — 13,293 |
| „ Motor Buses | „ 26 | Nil | 672 | + 672 | 30 | 20,113 | + 20,113 |
| „ Total | „ 26 | 410 | 672 | + 262 | 30 | 20,113 | + 6,820 |
| Chesterfield Corp. | „ 29 | 1,979 | 2,030 | + 51 | 30 | 58,259 | + 1,043 |
| Colchester Corp. | „ 25 | 526 | 587 | + 61 | 31 | 19,038 | + 1,942 |
| Colne Corporation | „ 29 | 667 | 703 | + 36 | 30 | 21,420 | — 400 |
| Coventry Corporation | „ 26 | 2,172 | 1,566 | — 606 | 30 | 58,434 | — 5,392 |
| „ Motor Buses | „ 26 | 1,726 | 1,838 | + 112 | 30 | 53,644 | + 5,888 |
| „ Total | „ 26 | 3,898 | 3,404 | — 494 | 30 | 112,078 | + 496 |
| Darlington Corp | „ 25 | 984 | 1,032 | + 48 | 29½ | 31,683 | + 2,449 |
| Derby Corporation | „ 25 | 2,480 | 2,414 | — 66 | 30 | 73,300 | — 2,416 |
| „ Motor Buses | „ 25 | 788 | 942 | + 154 | 30 | 27,557 | + 5,584 |
| „ Total | „ 25 | 3,268 | 3,356 | + 88 | 30 | 100,857 | + 3,168 |
| Dover Corporation | „ 25 | 362 | 387 | + 25 | 30 | 13,428 | + 448 |
| Dundee Corporation | „ 14 | 2,598 | 2,519 | — 79 | 21½ | 55,705 | — 1,981 |
| „ Motor Buses | „ 14 | 843 | 1,160 | + 317 | 21½ | 24,751 | + 6,343 |
| „ Total | „ 14 | 3,441 | 3,679 | + 238 | 21½ | 80,456 | + 4,362 |
| East Ham Corp. | „ 25 | 2,299 | 2,218 | — 81 | 29½ | 68,234 | + 144 |
| Edinburgh Corp. | „ 18 | 14,352 | 14,758 | + 406 | 22½ | 336,316 | + 5,823 |
| „ Motor Buses | „ 18 | 3,439 | 3,732 | + 293 | 22½ | 85,391 | + 6,698 |
| „ Total | „ 18 | 17,791 | 18,490 | + 699 | 22½ | 421,707 | + 12,521 |
| Exeter Corporation | „ 29 | 829 | 720 | — 109 | 31 | 24,902 | — 2,262 |
| „ Motor Buses | „ 29 | 193 | 396 | + 203 | 31 | 10,391 | + 5,729 |
| „ Total | „ 29 | 1,022 | 1,116 | + 94 | 31 | 35,293 | + 3,467 |
| Glasgow Corporation | „ 25 | 45,780 | 44,410 | — 1,370 | 21 | 911,346 | — 6,900 |
| „ Motor Buses | „ 25 | 6,700 | 10,438 | + 3,738 | 21 | 183,909 | + 68,608 |
| „ Total | „ 25 | 52,480 | 54,848 | + 2,368 | 21 | 1,095,255 | + 61,708 |
| Gloucester Corp. | „ 22 | 597 | 723 | + 126 | 29½ | 21,250 | + 4,175 |
| Grimsby Corporation | „ 18 | 1,403 | 1,588 | + 185 | 29 | 46,726 | + 4,793 |
| Halifax Corporation | „ 21 | 4,605 | 5,173 | + 568 | 29½ | 151,507 | + 16,398 |
| Huddersfield Corp. | „ 25 | 6,352 | 6,409 | + 57 | 30 | 191,958 | — 1,856 |
| Hull Corporation | „ 25 | 6,179 | 5,693 | — 486 | 30 | 172,267 | — 7,364 |
| „ Motor Buses | „ 25 | 1,410 | 1,751 | + 341 | 30 | 48,486 | + 7,485 |
| „ Total | „ 25 | 7,589 | 7,444 | — 145 | 30 | 220,753 | + 121 |
| Ilford Corporation | „ 25 | 1,492 | 1,536 | + 44 | 29½ | 45,227 | + 605 |
| Ipswich Corp. Trol. Bus | „ 25 | 1,269 | 1,348 | + 79 | 29½ | 40,833 | + 2,189 |
| Isle of Thanet | „ 22 | 463 | 442 | — 21 | 42½ | 37,434 | — 4,506 |
| Kilmarnock Corp. | „ 25 | 496 | 520 | + 24 | 23½ | 11,599 | + 513 |
| Lancashire Un. | „ 19 | 2,309 | 2,130 | — 179 | 41½ | 88,977 | — 5,336 |
| „ Motor Buses | „ 19 | 4,820 | 5,322 | + 502 | 41½ | 208,635 | + 25,944 |
| Leeds Corporation | „ 25 | 19,562 | 20,394 | + 832 | 29½ | 595,764 | + 9,666 |
| Leicester Corp. | „ 25 | 8,613 | 8,572 | — 41 | 30 | 250,590 | — 69 |
| Lincoln Corp. | Sept. 14 | 966 | 1,002 | + 36 | 24 | 22,768 | + 76 |
| Liverpool Corp. | Oct. 25 | 26,706 | 26,580 | — 126 | 29½ | 800,395 | — 14,046 |
| „ Motor Buses | „ 25 | 2,908 | 3,210 | + 302 | 29½ | 98,556 | + 14,387 |
| „ Total | „ 25 | 29,614 | 29,790 | + 176 | 29½ | 898,951 | + 341 |
| London County Coun. | „ 29 | 84,614 | 82,872 | — 1,742 | 30½ | 2,508,697 | — 23,072 |
| Luton Corporation | „ 22 | 394 | 408 | + 14 | 29½ | 12,617 | + 284 |
| Maidstone Corp. | „ 23 | 140 | Nil | — 140 | 29½ | Nil | — 6,433 |
| „ Motor Buses | „ 23 | 334 | 271 | — 63 | 29½ | 8,326 | — 860 |
| „ Trolley Buses | „ 23 | 282 | 576 | + 294 | 29½ | 18,390 | + 9,176 |
| „ Total | „ 23 | 756 | 847 | + 91 | 29½ | 26,716 | + 1,883 |
| Manchester Corp. | „ 18 | 35,796 | 32,798 | — 2,998 | 29 | 926,545 | — 85,397 |
| „ Motor Buses | „ 18 | 4,830 | 9,097 | + 4,267 | 29 | 251,261 | + 106,977 |
| „ Total | „ 18 | 40,626 | 41,895 | + 1,269 | 29 | 1,177,806 | + 21,580 |
| Middlesbrough Corp. | „ 28 | 1,065 | 959 | — 106 | 30½ | 31,131 | — 3,402 |
| „ Motor Buses | „ 28 | 540 | 527 | + 13 | 30½ | 17,160 | + 1,102 |
| „ Total | „ 28 | 1,605 | 1,486 | — 119 | 30½ | 48,291 | — 2,300 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name | Week ended | Latest Return 1929 | Latest Return 1930 | + or − | Aggregate Wks. | Aggregate 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty. Corp. | Oct. 25 | 10,981 | 8,766 | — 2,215 | 29½ | 257,518 | — 44,979 |
| „ Motor Buses | „ 25 | 2,043 | 3,596 | + 1,553 | 29½ | 96,057 | + 34,529 |
| „ Total | „ 25 | 13,024 | 12,362 | — 662 | 29½ | 353,575 | — 10,450 |
| Newport Corporation | „ 18 | 1,619 | 1,135 | — 484 | 29 | 42,177 | — 6,185 |
| „ Motor Buses | „ 18 | 753 | 1,330 | + 577 | 29 | 28,129 | + 6,129 |
| „ Total | „ 18 | 2,372 | 2,465 | + 93 | 29 | 70,306 | — 56 |
| Northampton Corp. | „ 17 | 1,127 | 754 | — 373 | 28½ | 29,213 | — 2,784 |
| „ Motor Buses | „ 17 | 686 | 1,053 | + 367 | 28½ | 23,395 | + 4,083 |
| „ Total | „ 17 | 1,813 | 1,807 | — 6 | 28½ | 52,608 | + 1,299 |
| Nottingham Corp. | „ 23 | 6,335 | 5,818 | — 517 | 29½ | 170,909 | — 25,788 |
| „ Motor Buses | „ 23 | 2,650 | 3,653 | + 1,003 | 29½ | 100,216 | + 30,585 |
| „ Trolley Buses | „ 23 | 619 | 1,225 | + 606 | 29½ | 35,565 | + 17,984 |
| „ Total | „ 23 | 9,604 | 10,696 | + 1,092 | 29½ | 306,690 | + 22,781 |
| Oldham Corporation | „ 25 | 3,580 | 3,414 | — 166 | 31 | 103,623 | — 6,740 |
| „ Motor Buses | „ 25 | 1,923 | 1,881 | — 42 | 31 | 61,379 | — 1,109 |
| „ Total | „ 25 | 5,503 | 5,295 | — 208 | 31 | 165,002 | — 7,849 |
| Plymouth Corp. | „ 25 | 3,508 | 3,463 | — 45 | 29½ | 110,535 | — 4,785 |
| „ Motor Buses | „ 25 | 2,012 | 2,589 | + 577 | 29½ | 74,654 | + 16,011 |
| „ Total | „ 25 | 5,520 | 6,052 | + 532 | 29½ | 185,189 | + 11,226 |
| Portsmouth Corp. | „ 25 | 3,612 | 3,347 | — 265 | 30 | 131,743 | — 12,235 |
| „ Motor Buses | „ 25 | 1,674 | 2,892 | + 1,218 | 30 | 103,132 | + 39,753 |
| „ Total | „ 25 | 5,286 | 6,239 | + 953 | 30 | 234,875 | + 27,458 |
| Preston Corporation | „ 22 | 1,670 | 1,719 | + 49 | 29½ | 49,337 | — 2,118 |
| „ Motor Buses | „ 22 | 507 | 534 | + 27 | 29½ | 15,327 | + 771 |
| „ Total | „ 22 | 2,186 | 2,253 | + 67 | 29½ | 64,664 | — 1,347 |
| Rawtenstall Corp. | „ 26 | 847 | 660 | — 187 | 29½ | 19,361 | — 5,887 |
| „ Motor Buses | „ 26 | 509 | 717 | + 208 | 29½ | 20,895 | + 5,214 |
| „ Total | „ 26 | 1,356 | 1,377 | + 21 | 29½ | 40,256 | — 673 |
| Reading Corporation | „ 23 | 1,522 | 1,477 | — 45 | 30 | 42,977 | — 2,184 |
| „ Motor Buses | „ 23 | 889 | 1,025 | + 136 | 30 | 30,146 | + 2,849 |
| „ Total | „ 23 | 2,411 | 2,502 | + 91 | 30 | 73,123 | + 665 |
| Rochdale Corp. | „ 25 | 2,795 | 2,259 | — 536 | ... | 81,925 | — 5,776 |
| „ Motor Buses | „ 25 | 1,572 | 2,178 | + 606 | — | 47,268 | + 20 |
| „ Total | „ 25 | 4,367 | 4,437 | + 70 | ... | 129,193 | — 5,756 |
| Rotherham Corp. | „ 27 | 2,960 | 2,917 | — 73 | 30 | 83,740 | + 2,029 |
| Salford Corporation | „ 26 | 11,332 | 11,168 | — 164 | 29½ | 333,361 | — 1,488 |
| Sheffield Corp. | „ 25 | 20,820 | 20,501 | — 319 | 28½ | 609,417 | — 20,566 |
| Southampton Corp. | „ 22 | 3,223 | 3,470 | + 247 | 30 | 104,440 | + 2,209 |
| „ Motor Buses | „ 22 | 805 | 890 | + 85 | 30 | 26,034 | + 2,794 |
| „ Total | „ 22 | 4,028 | 4,360 | + 332 | 30 | 130,524 | + 5,003 |
| Southend-on-Sea Corp. | „ 29 | 1,821 | 1,801 | — 20 | 30½ | 70,101 | — 3,501 |
| „ Trolley Buses | „ 29 | 196 | 246 | + 50 | 30½ | 10,077 | + 3,145 |
| „ Total | „ 29 | 2,017 | 2,047 | + 30 | 30½ | 80,178 | — 359 |
| Southport Corp. | „ 25 | 1,174 | 1,226 | + 52 | 29½ | 41,436 | — 680 |
| „ Motor Buses | „ 25 | 315 | 364 | + 49 | 29½ | 13,322 | + 1,162 |
| „ Total | „ 25 | 1,489 | 1,590 | + 101 | 29½ | 54,758 | + 482 |
| St. Helens Corp. | „ 21 | 1,964 | 2,029 | + 65 | 29½ | 59,902 | + 2,905 |
| Sunderland Corp. | „ 28 | 2,349 | 2,090 | — 259 | 30 | 74,344 | — 418 |
| „ Motor Buses | „ 28 | 235 | 697 | + 462 | 30 | 18,399 | + 11,598 |
| „ Total | „ 28 | 2,584 | 2,787 | + 203 | 30 | 92,743 | + 11,178 |
| Swindon Corp. | „ 22 | 779 | 958 | + 179 | 29½ | 29,231 | + 5,567 |
| Wallasey Corp. | „ 25 | 1,164 | 1,160 | — 4 | 29½ | 37,665 | — 3,196 |
| „ Motor Buses | „ 25 | 1,761 | 1,962 | + 201 | 29½ | 72,025 | + 6,796 |
| „ Total | „ 25 | 2,925 | 3,122 | + 197 | 29½ | 109,690 | + 3,600 |
| Walsall Corporation | „ 19 | 3,494 | 3,814 | + 320 | 29 | 101,191 | + 1,982 |
| Walthamstow Corp. | „ 25 | 2,397 | 2,433 | + 36 | 29½ | 71,005 | — 462 |
| Warrington Corp. | „ 23 | 896 | 917 | + 21 | 30 | 26,663 | + 197 |
| „ Motor Buses | „ 23 | 470 | 514 | + 44 | 30 | 15,074 | + 1,650 |
| „ Total | „ 23 | 1,366 | 1,431 | + 65 | 30 | 41 737 | + 1,847 |
| West Ham Corp. | „ 23 | 6,129 | 6,067 | — 62 | 29½ | 178,145 | — 775 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses | „ 19 | 2,709 | 2,513 | — 196 | 29 | 71,310 | — 10,460 |
| „ Trolley Buses | „ 19 | 3,411 | 3,555 | + 144 | 29 | 100,898 | + 3,905 |
| „ Total | „ 19 | 6,120 | 6,068 | — 52 | 29 | 172,208 | — 6,555 |
| York Corporation | „ 22 | 979 | 964 | — 15 | 30 | 31,251 | — 559 |
| „ Motor Buses | „ 22 | 409 | 529 | + 120 | 30 | 15,399 | + 3,677 |
| „ Trolley Buses | „ 22 | 61 | Nil | — 61 | 30 | Nil | — 1,636 |
| „ Total | „ 22 | 1,449 | 1,493 | + 44 | 30 | 46,650 | + 1,482 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name | Week or M'th. | Latest Return 1929 | Latest Return 1930 | Wks. or *M* | Aggregate 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Oct. 28 | £87,075 | £79,967 | 43 w | £3,519,707 | — £188,818 |
| Brazilian Traction $ | Sept. | 4,225,416 | 3,906,162 | 9 *m* | 36,086,347 | — 865,449 |
| British Columbia $ | Aug. | 1,168,753 | 1,194,390 | 2 *m* | 2,390,629 | + 65,156 |
| Buenos Aires Lacroze | Oct. 26 | 12,019 | 11,786 | 17 w | 184,857 | — 12,402 |
| Burma E. Sup. Co. Rs. | Sept. | 59,467 | 65,852 | 2 *m* | 132,270 | + 11,494 |
| Calcutta ... Rs. | Oct. 25 | 115,229 | 96,703 | 42½ w | 4,699,050 | — 709,613 |
| Cape Town ... ... | Sept. | 26,579 | 24,295 | ... | ... | ... |
| Carthagena & Herrerias | Sept. | 660 | 437 | 9 *m* | 7,292 | — 1,458 |
| Durban Corporation | Sept. | 22,371 | 21,156 | 2 *m* | 46,227 | — 1,763 |
| East India ... ... | Sept. | 4,126 | 3,731 | 2 *m* | 7,679 | — 599 |
| Kalgoorlie ... ... | July | 1,664 | 1,776 | 7 *m* | 11,662 | + 137 |
| Madras (2 weeks) Rs. | Oct. 15 | 46,623 | 50,006 | 40 w | 886,532 | + 49,226 |
| Para ... ... | Sept. | 15,210 | 12,196 | 10 *m* | 143,500 | — 5,026 |
| Port Elizabeth ... | Sept. | 7,190 | 6,670 | ... | ... | ... |
| Rangoon ... Rs. | Sept. | 122,850 | 147,775 | 9 *m* | 1,345,030 | + 267,189 |
| Shanghai ... $ | Sept. | 365,828 | 418,059 | 9 *m* | 3,097,758 | + 101,709 |
| Singapore ... ...$ | Sept. | 126,000 | 140,000 | 12 *m* | 1,650,000 | + 179,000 |
| Winnipeg ... ...$ | Aug. | 494,642 | 445,908 | 8 *m* | 4,171,624 | — 161,031 |

## RAILWAY RECEIPTS.

| 43rd Week ended Oct. 26th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 207,000 | — 7,000 | 333,000 | — 9,000 | 540 000 | — 16,000 | —1,170,000 |
| L.M.S.R. | 473,000 | — 19,000 | 768,000 | — 85,000 | 1,241,000 | — 104,000 | —4,026,000 |
| L.N.E.R. | 315,000 | — 8,000 | 656,000 | — 81,000 | 971,000 | — 89,000 | —2,704,000 |
| S.R. | 277,000 | — 12,000 | 111,000 | — 1,000 | 388,000 | — 13,000 | — 508,000 |
| Totals | 1,272,000 | — 46,000 | 1,868,000 | — 176,000 | 3,140,000 | — 222,000 | —8,408,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | Latest Return. 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Oct. 25 | 291,600 | 309,600 | + 18,000 | 12,973,300 | + 677,600 |
| Lond. & Sub. Group | „ 25 | 42,900 | 45,500 | + 2,600 | 1,911,600 | + 106,200 |
| Metropolitan Railway | „ 25 | 37,800 | 36,400 | — 1,400 | 1,570,400 | + 13,600 |
| Liverpool Overhead | „ 26 | 1,591 | 1,408 | — 183 | 67,424 | — 5,634 |
| Mersey Railway ... | „ 25 | 4,452 | 4,388 | — 64 | 194,847 | + 3,850 |

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LONDON, NOVEMBER 8, 1930.

## THE ROAD TRAFFIC ACT IN STAGES.

April 1 is, as already indicated in these columns, the date when the two parts of the Road Traffic Act that most closely concern municipal and private owners of omnibuses come into operation. In the case of Part IV, which deals with the licensing and regulation of public service vehicles, important details have to be arranged before it can become operative, and with their completion Part V will also come into force. Part V enables local authorities already in possession of motor omnibus powers to extend their routes beyond the local boundaries, after obtaining the consent of the Commissioners. In relation to Part IV, the Minister of Transport is engaged in the task of appointing the chairman of the Traffic Commissioners and his two colleagues in each of the twelve provincial areas, and the single Commissioner in London. The selections will probably be made known before the end of November, and shortly afterwards the Ministry may be expected to announce the successful applicants for the position of vehicle certifying officers in each area. It may be taken for granted that out of the large number of applicants for the position of Commissioner the Minister will be able to choose men who are well acquainted with the area. Such knowledge will materially assist them in the delicate tasks that will have to be undertaken, acting from the start on lines calculated to secure co-ordination of services in areas other than the Metropolitan. Prior to April 1 all the vehicles must receive a certificate of fitness from the certifying officers, and will then be granted public service vehicle licences, with conditions attached thereto for the control and co-ordination of passenger services by road. Public sittings will be held for the hearing of applications for, and objections to, the grant or backing of road service licences and for other purposes. The Commissioners will have the granting of consents to local authorities to operate omnibuses on routes outside their area, and it is certain that these applications will be closely watched by other operators who may be affected thereby. Another duty under Part IV will be to advise the Minister on orders made by local authorities under Section 90 in respect of the routes, stopping places, parking places and stands for public service vehicles. Long-distance coach owners will find that they are effectively controlled as regards speed, for their time-tables or other particulars as to the times to be taken on the journeys must be submitted with the applications for licences. If from these particulars it seems likely that the limit applicable to the vehicle will be contravened, the Commissioners are required to refuse licences. Not the least important task will be the granting of licences to drive or to act as conductor of a public service vehicle. Such drivers will have to comply with the new regulation in Part I for the issue of licences, which Part comes into force on December 1. After further consultation with the British Medical Association the Minister has modified the requirement as to eyesight. An applicant for a licence must be able to read at a distance of 25 yards in good daylight (with glasses if worn) a car plate number containing six letters and figures. Part II, relating to third-party insurance, comes into force on January 1 next. The same date is fixed for the introduction of Part III. This will include the Highway Code, which has not yet been agreed upon.

## LONDON COACH CONGESTION.

THE PROBLEM TO BE INVESTIGATED.

The Minister of Transport has requested the London and Home Counties Traffic Advisory Committee to investigate the increased congestion resulting from the growth of long-distance omnibus and coach traffic between the provinces and the Metropolis. It is understood that the Minister has asked for recommendations to be submitted before December 31. Further, it is stated that the police and the Home Office desire that the entry of such vehicles should be prohibited in an area of 1½ miles from Charing Cross. In a little over a year, the number of coaches using road sites for taking up and setting down passengers has grown from 600 to more than 1,500, and about 5,000 of these vehicles are entering London daily in the busy season.

## HULL TRAMWAYS MANAGER NOT TO RESIGN.

Mr. E. S. Rayner, the general manager and engineer of Hull Corporation Tramways, Mr. B. J. G. Bruce, works superintendent, and Mr. H. D. Ingram, assistant engineer, have written to the Corporation declining to resign. It will be recalled that at a special meeting of the City Council they were asked to resign their positions. In the meantime, as mentioned in last week's issue, Councillor J. G. Hewett has given notice of a motion asking the Council to rescind their previous decision in this matter. This notice of motion automatically suspends the operation of the resolution. As the result of the municipal elections, the Labour Party is no longer in a majority.

## FINANCIAL ITEMS.

**Ribble Motor Services** announce an interim ordinary dividend of 9 3-5d. per share. The rate is the same as a year ago.

**W. T. Henley's Telegraph Works Co., Ltd.,** has declared an interim dividend on ordinary shares of 1s. 6d. per share including income tax.

**Allen-Liversidge, Ltd.,** manufacturers of dissolved acetylene and oxy-acetylene and electric welding, cutting and lighting equipment, announce a dividend of 6½ per cent. on the preference shares for the six months ended October 31, 1930.

**Halley Motors, Ltd.**—An offer was made recently for the controlling interest in Halley Motors, Ltd., and we are informed that sufficient shares have been offered by the shareholders to enable the scheme to be carried through.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended November 5 amounted to £82,590, a decrease of £994 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to November 5 (31 2-7 weeks) the total receipts were £2,591,289, a decrease of £26,121.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended October 18 gave total receipts of £426,055, or £5,771 more than in the corresponding week of last year. The aggregate receipts for twenty-nine weeks amounted to £12,274,918, an increase of £124,213 over the corresponding period of last year.

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## THE SCOTTISH MOTOR EXHIBITION.

NEW MODELS FOR PASSENGER SERVICES.

The 29th Scottish Motor Exhibition was opened in Kelvin Hall, Glasgow, yesterday (Friday), and will remain open until Saturday next. The exhibition includes both pleasure cars and commercial vehicles. As there is no commercial vehicle exhibition in London this year, special interest attaches to the heavy vehicle section at Glasgow. All the commercial exhibits are in one section of the exhibition, on stands numbered from 102 to 146.

**Albion Motor Car Co., Ltd.** (Stand 128).—A range of six machines includes three new models. Two of the latter are passenger vehicles—a 20-seat omnibus to be known as the Albion "Victor," and a 32-seat coach named the "Valkyrie." The former is arranged to seat the passengers three abreast, two on one side of the gangway and one on the other. Its 14 ft. 6 ins. wheel-base takes a body which permits much more leg room. The "Viking" six-cylinder model is shown with a 32-seat front entrance service body.

**Associated Equipment Co., Ltd.** (Stand 134).—There is here an excellent example of a long-distance saloon coach on the A.E.C. "Regal" chassis with body by Duple Bodies & Motors, Ltd. It has front and rear doors, and a Walman sliding head. The goods vehicle is the 110 h.p. "Mammoth" flat platform lorry, with the A.E.C. standard cab. A specially attractive feature at this stand is the new six-cylinder heavy oil high-speed engine for public passenger and goods transport.

**Commer Cars, Ltd., Luton** (Stand 113).—Two examples of the improved "Invader" passenger chassis comprise one with a 20-seat rear-entrance body of standard type, and another with a 14-seat luxury coach body. A feature of the "Invader" chassis is the exclusive "silent third" gear.

**Crossley Motors, Ltd.** (Stand 144).—A comprehensive display includes a double-deck omnibus seating 52, to the order of Aberdeen Corporation; a single-deck municipal omnibus with a front entrance and an emergency door at the rear; and a luxury type coach with a Sunsaloon roof. Both the single-deck vehicles are on the "Arrow" chassis, which is also shown in bare form. The 38-110 h.p. six-cylinder engine fitted to the "Arrow" chassis is also on view.

**Dennis Bros., Ltd.** (Stand 126).—A wide selection of Dennis models on the stand of Rossleigh, Ltd., includes three goods models which have not been previously shown. The "Arrow" is shown as a bare chassis, so that its excellent points can be observed. It is also staged with a luxurious saloon coach body, arranged to seat 28, built by Duple Bodies & Motors, Ltd. This has a Sunsaloon head.

**Daimler Co., Ltd.** (Stand 130).—Chief interest here is in the new low-loading chassis fitted with the Daimler transmission system, comprising the fluid flywheel and the pre-selective self-changing gearbox. This is shown as a bare chassis and also with a double-deck omnibus enclosed staircase body by Park Royal (Coachbuilders), Ltd.

**Gilford Motor Co., Ltd.** (Stand 139).—Two passenger vehicles and a van are on the stand of Peter Crerar, of Crieff. One has a 32-seat single-deck omnibus body and the other a 20-seat saloon coach body, with a sliding roof.

**Guy Motors, Ltd.** (Stand 143).—Three passenger models, one shown for the first time, are on view. The "Invincible" four-wheel double-deck omnibus and the "Conquest" chassis with a single-deck omnibus body of a new design with sloping sides, make a worthy display. Special interest is being taken in a new Guy model shown as a sunshine 20-seat saloon coach. The chassis, to be known as the "Victory," has a six-cylinder engine and is designed for fast services.

**Halley Motors, Ltd.** (Stand 129).—Six machines on view here include four goods and two passenger vehicles. The outstanding exhibit is the new six-cylinder engine, designed for high-speed coach and double-deck omnibus operation. A handsome all-weather saloon is mounted on the "Chieftain" chassis, which is fitted with the new engine. The four-cylinder "Conqueror" chassis has a rear entrance 30-seat omnibus body.

**Leyland Motors, Ltd.** (Stand 142).—Three complete vehicles are on the Leyland stand, a "Tiger" chassis fitted with a standard front entrance 32-seat saloon omnibus, and two goods models.

**Maudslay Motor Co., Ltd.** (Stand 111).—Two examples of public service vehicles on this stand are the Maudslay "Majestic" double-deck ominbus seating 52, and a 32-seat "Meteor" single-deck omnibus. The former has a body built by Ransomes, Sims & Jefferies, and the later a body by Duple Bodies & Motors.

**Reo Motors, Ltd.** (Stand 136).—Two interesting models of the popular Reo chassis—one passenger and one for goods service—are displayed on the stand of the company's Scottish agents, Bass Rock Motor Co., of Edinburgh.

**Chas. Roberts & Co.** (Stand 105).—Two coach bodies to be seen here embrace a number of special features. A long distance 28-seat saloon coach is mounted on a Commer Car chassis. The other exhibit, arranged to seat 32, is on the A.J.S. chassis.

**T.S. Motors, Ltd.** (Stand 109).—An outstanding novelty is the new petrol-electric trolleybus chassis which has been produced at the Maidstone works. This vehicle can be operated as a trolleybus with overhead wires and then, on reaching the end of that system, the engine can be started up by the reversing of a lever, the vehicle continuing its journey as a petrol-electric omnibus. The basis of the system is the well-known Tilling-Stevens petrol-electric transmission, and in operation it should show a marked advantage over the route-tied vehicles. The "T.S." gear-driven "Express" chassis is shown fitted with a 32-seat body.

**John I. Thornycroft & Co., Ltd.** (Stand 146).—Three noteworthy models from the Thornycroft wide range comprise a double-deck omnibus on the "B.C." forward control chassis, a 6-ton platform lorry on the "J.J." forward control chassis, and a new model of a special type to take a load of 2½ tons. This is known as the "A.7" type, and is fitted with a 25-6 h.p. engine and four-speed gear-box.

**Vulcan Motor & Engineering Co., Ltd.** (Stand 131).—The "Emperor" omnibus chassis designed for service with a double-deck body, is on exhibition. It has a six-cylinder engine of ample capacity.

## CONTRACTS.

**Ransomes, Sims & Jefferies, Ltd.,** have an order for another trolleybus from Nottingham Corporation.

**Bournemouth Roads Committee** has placed an order with the Forest City Electric Co., for traffic control signals at £1,108 15s.

**Hull Corporation** has accepted the following tenders:—Dennis Bros., Ltd., four chassis at £862; Ransomes, Sims & Jefferies, Ltd., four 'bus chassis at £725; Leyland Motors, Ltd., four 'buses at £1,650.

**Rotherham Transport Committee** has recommended the Council to enter into an agreement with the National Benzole Co., for the supply of spirit for 12 months, the price to be subject to the general rise and fall in petrol prices.

**Marble Arch Station** of the Central London Railway is undergoing reconstruction by Mitchell Bros., Sons & Co. The work will occupy a year and a half, and will cost £92,000. Several other stations are to be reconstructed during the next few years.

**Walsall Transport Committee** has placed an order with the Associated Equipment Co. for a "Regent" chassis fitted with the A.E.C. 95 h.p. oil engine. Short Bros. (Rochester and Bedford), Ltd., have an order to supply a double-deck covered-top body for the chassis.

**Sunderland Corporation** has approved the contract recently arranged by the chairman and general manager for Russian petrol, which was criticised at the last meeting of the Council. It was decided that in future contracts of this kind should be brought before the Committee and reported to the Council.

**The Ford Motor Co.** has placed an order with Crompton and Parkinson, Ltd., for 1,460 "KLOSD" A.C. motors for the equipment of the new works at Dagenham, Essex. This important order, which has been obtained in competition with other electrical motor makers in this country, is believed to be the largest ever placed for standard motors of one type. The motors will be delivered from the regular production schedule at Guiseley.

**London County Council** has confirmed a contract with Sir William Arrol & Co., Ltd., for the maintenance of the temporary Waterloo Bridge and the support of the old bridge for a further period of one year from January 30, 1931. The Committee's report stated that the question of dealing with Waterloo Bridge is interlocked with that of a road bridge at Charing Cross. The submission to the Council of any further recommendations in regard to the reconditioning of Waterloo Bridge has accordingly been postponed.

**New Cars for Leyton.**—Tenders were received on October 30 for 50 new cars required by the Leyton Borough Council, which are to be handed over to the L.C.C. as a condition of the extension of the lease for the running of the Leyton tramways for another 25 years. As the matter is regarded as urgent, the chairman of the electric lighting and tramways committee, Councillor Thorn, was authorised to open the tenders and to send them to the L.C.C. for the observations of that authority before the tenders were submitted to the Leyton Council.

**John I. Thornycroft & Co., Ltd.,** have orders from the L.N.E.R. for 17 30-cwt. and 2-ton vehicles, and from the G.W.R. for one 10-ton six-wheel chassis. Other recent orders for passenger and freight vehicles have been received from the Texas Oil Co., Ltd., two 1,500 gallon tank wagons; J. Blake & Co., Ltd., Phillip Mills & Co., Ltd., Charles Nelson & Co., Ltd., Bristol Co-operative Society, Cement Manufacturers, Stockton, Sadler & Co., Ltd., British-Controlled Oilfields, People's Motor Services, Ltd., Southgate and District Gas Co., Cambridge Gaslight Co., and Reading Corporation. All are repeat orders.

**New Rolling Stock for the Metropolitan Railway.**—The Birmingham Railway Carriage and Wagon Co. are building 18 motor-coaches, 14 driving trailer coaches, 14 first-class coaches, and 19 third-class coaches for the Metropolitan Railway. The electrical equipment will be manufactured by the General Electric Co. There will be four motors to a coach, each of 275 h.p., and the control gear will be of the electro-pneumatic type. The coaches will have steel roofs and steel-sheeted sides with mouldings painted on. In other respects the new rolling stock will be similar to the latest rolling stock now in use by the company.

**The L.C.C. Highways Committee,** in their quarterly report for the three months ended September 30, mention that the following orders had been placed: English Steel Corporation, Ltd., 3,000 driving steel tyres and 3,000 pony wheel tyres; Equipment & Engineering Co., Ltd., 28 E.C.O. double-jet hot-air hand-dryers; David Brown and Sons (Hudd.), Ltd., 50 gear wheels, solid, for Class M.V.121 motors, and 50 gear wheels, solid, for Class M.V.128 and 124 motors; Metropolitan Vickers Electrical Co., Ltd., 50 gear wheels solid for Class D.K.31 C. motors; F. W. Rowland & Co., 150 pinions, tie-bars; Bayliss, Jones & Bayliss, Ltd., 25,000 tie-bars slot to track rail, 1,500 tie-bars slot to yoke, and 7,500 tie-bars, flat.

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## MISCELLANEOUS NEWS AND NOTES.

**Burnley Tramways Committee** is considering the provision of shelters in various parts of the town.

**Nottingham Tramways Committee** proposes to seek powers to extend some of the omnibus services beyond the borough limit.

**Birkenhead Developments.**—The Tramways and Motors Committee has prepared a revised scheme for the construction of a new car shed and omnibus garage at a cost of £18,500.

**An Australian Trolleybus Proposal.**—A scheme for running trolleybuses between Manly and Spit Junction is being considered by the Metropolitan Transport Trust, New South Wales.

**Armistice Day Observance.**—In Glasgow the general signal for the approach of the silence will be the lighting of the tramcars at 10.55 a.m., and the current will be switched off at 11 a.m.

**London Tramway Map.**—The Highways Committee of the London County Council recently authorised the production of 4,700 copies of the tramways wall map, including 3,700 mounted and varnished, at a cost not exceeding £400.

**Coach Accident in the City.**—A Brentwood-London coach skidded in Queen Victoria-street on Sunday afternoon and smashed a gas standard, the escaping gas catching fire. As is usual on Sundays, the street was almost free from traffic.

**Merthyr Watch Committee** has granted six licences to the South Wales Transport Co., Ltd., for service between Merthyr and Swansea, and two additional licences to the Pilot Red Services, Ltd., for their London-Llanelly coach service.

**Sheffield Tramwaymen's Decision.**—The employees of the Sheffield Corporation Tramways Department have decided that rather than accept the dismissal of any men, the whole of the staff should share the work, working fewer shifts.

**Sheffield Electricity Committee** has received sanction to borrow the following sums required for the proposed supply of electricity to the tramways: £2,056, sub-station equipment and buildings; £5,975, distribution mains; and £9,238 for plant.

**Third-Class Sleepers.**—The London, Midland & Scottish Railway Company is building ten new third-class sleeping coaches. Since third-class sleepers were introduced, they have proved extremely popular, and have been added to many trains.

**Central Omnibus Station in Place of Stands.**—Hull Watch Committee favours the construction of one central omnibus station. Coaches coming into Hull now use various stands, and it is advocated that something should be done to regularise the increasing traffic.

**Mirror for Southend Employees.**—A full-length mirror has been placed at the main tramway depot at Southend with printed injunctions that drivers and conductors should have well-brushed cap and clothes, polished boots and buttons, a good shave, and pressed trousers.

**New British Columbia Power Unit.**—The new electrical power unit of the British Columbia Electric Railway Co. on Jordan River is expected to be put in operation on November 15. A new 18,000 h.p. water wheel which forms part of the equipment was manufactured by the English Electric Co., Ltd.

**Leeds Tramways Committee** has considered the memorandum drawn up by the town clerk and the general manager with respect to the draft agreement between the L.N.E.R. as to joint omnibus services. The town clerk has been asked to communicate further with the railway company on the subject.

**The Beama Dinner.**—The annual dinner of the British Electrical and Allied Manufacturers' Association will be held on Wednesday, November 19, at the Connaught Rooms, Great Queen-street, W.C.2. Lord Derby will be in the chair, and the speakers will include the Minister of Transport, Mr. Winston Churchill, M.P., Sir Hugo Hirst, and Sir E. Hilton Young, M.P.

**Glasgow Municipal Transport Services,** for the period June 1 to October 25, show an increased revenue of £57,896 compared with the corresponding period of last year. There were 10¼ million additional passengers, the total being 217 millions, of whom 185 millions were carried on the tramcars, 25¾ millions on the omnibuses, and the balance on the subway.

**Oil Electric Cars in U.S.A.**—A Reuter's message from New York states that the first of the new oil-electric cars made by the Westinghouse Company for the Erie Railway has been put in service. The car is equipped with two Diesel engines driving two Westinghouse generators and is capable of a maximum speed of 85 m.p.h. It is said to be able to run 1,000 miles without refuelling.

**West Ham Electricity Station.**—Yesterday (Friday) plant extensions which have cost £320,000 were inaugurated at the generating station of West Ham Corporation. The new 30,000 kw. turbo-alternator, which had been in successful operation for several months, was installed by the English Electric Co., while the British Thomson-Houston Co. provided the switchgear.

**Glasgow Report on a Paris Experiment.**—Mr. P. J. Dollan, convenor of Glasgow Transport Committee, in reporting on a recent visit to Paris, stated they witnessed trials with cars equipped for regenerative control, and were convinced that the adoption of the system would lead to a saving in energy. It was probable that Glasgow would obtain one of the equipments for experiment.

**Shortage of Omnibus Drivers.**—At a meeting of Glasgow Town Council on October 30, Councillor Dollan, convenor of the Transport Committee, said that there was a shortage of men competent to drive double-deck omnibuses. The Committee were preparing an area at Larkfield for a skidding track and they proposed to train drivers there. The Corporation, he added, insisted on a very severe test for these drivers, and the general manager had reported that many applicants had to be rejected for various causes.

**New Omnibuses for Norwich.**—The Norwich Electric Tramways Co. has put in service several new Leyland double-deck omnibuses. The "Eastern Daily Press," commenting on the new machines, says that "they look extremely, smart, and their introduction marks a definite step forward. The addition of an enclosed top deck at the beginning of the winter is a feature that is much appreciated."

**Economy of Services in Berlin.**—The Berlin Underground Railway, Tramway and Omnibus Undertaking is effecting every possible economy in the operation of the services. The salary of the managing director has been reduced from £6,000 a year to £2,500 and those of other directors have been halved. It is anticipated that other transport organisations in Germany will follow this example.

**Tramway-Omnibus Experiment at Sunderland.**—To give passengers an opportunity of comparing the tramways and omnibus services, the general manager of Sunderland Corporation Tramways proposes to put on the Hendon route a high-power tramcar of the latest type. This car will be run in competition with an omnibus service over the same route, and the public are to be asked which they prefer.

**Subsidence in Liverpool.**—Owing to a subsidence in Dale-street, Liverpool, one of the main central routes was suddenly closed to all traffic just before the morning rush hour on October 29. Mr. P. Priestly, the transport manager, stated that 274 tramcars had to be diverted, but by ten o'clock all the orders had been given and new time-tables made out and distributed. The work on the Mersey Tunnel underneath was not affected.

**Diesel Engine Omnibuses for Manchester.**—Mr. R. Stuart-Pilcher, general manager of Manchester Corporation Transport, expects to have an omnibus equipped with a crude oil engine on the streets within two or three weeks. The body will be by Crossley Motors, Ltd., and the engine by L. Gardner & Sons, Ltd., of Patricroft. It is estimated that the cost for fuel will be ½d. per mile, instead of 2½d. as for the petrol vehicles now in use.

**Cheap Sunday Fares in London Discontinued.**—On November 2 the 2d. all-the-way fare on Sundays on the L.C.C. tramways, introduced three months ago as an experiment, was discontinued. The special cheap return fares which were introduced on certain sections of the Underground Railways on Sundays as an experiment during the summer months and the Sunday 2d. all-the-way fares on the L.G.O.C. omnibuses have also been withdrawn.

**Trolleybuses Proposed at Portsmouth.**—At a meeting of Portsmouth City Council on October 28, Alderman Sir John Timpson, K.B.E., chairman of the Tramways Committee, stated, in reply to a question as to when the tramway lines in Fawcett-road would be renewed, that the Committee were anxious to consider installing a trolleybus service which could be continued to Greetham-street, and as far as the Unicorn Gates of the Dockyard.

**Railway Wages Question.**—The Executive Committee of the National Union of Railwaymen decided on November 6 to accept the invitation of the railway managers to a conference on Thursday next to consider the position of the railways. On the following day there will be a similar meeting between representatives of the Union and of the Irish Railways. The meeting between the British railway managers and the Shopmen's Council has been fixed for November.

**Large Extension of G.W.R. Road Freight Services.**—The Great Western Railway announces the intention to spend the sum of £89,786 on 152 new motor vehicles and tractors for use in connection with the company's freight services. In spite of trade depression the tonnage of traffic collected by the company's new method of co-ordinated rail and road transport shows an increase of 28,750 tons per month over the corresponding periods of last year, and represents an increase of 53 per cent., or 157,000 tons per month over 1922.

**The Change-over on Tees-side.**—Stockton Corporation has come into line with Middlesbrough Corporation as regards the first steps to be taken to substitute omnibuses for tramways. Stockton Corporation Bill gives power to abandon the tramways in 1932, but the Council is anxious to make the change earlier and has suggested to Middlesbrough that this should take place at once. Middlesbrough has not agreed, but is ready to make a partial substitution. Under the arrangement proposed the tramways would be retained and twelve omnibuses would be run jointly on the two routes Stockton Town Hall and Middlesbrough Town Hall, via the Wilderness and Acklan.

## PERSONAL.

**Alderman Thorpe** has been nominated to represent the Ripon City Council on the panel from which the Commissioner will be selected for the Yorkshire traffic area under the Road Traffic Act.

**Presentation to Mr. C. Owen Silvers.**—At a meeting of the Midland Municipal Tramways and Transport Association two arm-chairs were presented to Mr. C. Owen Silvers, general manager of Wolverhampton Corporation Tramways, who, after ten years' service, has relinquished the office of honorary secretary. Wolverhampton, Birmingham, Burton-on-Trent, Cardiff, Coventry, Derby, Gloucester, Leicester, Nottingham, Northampton, Walsall and West Bromwich tramways were represented. Mr. A. C. Baker, general manager of Birmingham Transport, who made the presentation, paid a generous tribute to the work of Mr. Silvers and his activities in Wolverhampton, where many deputations had inspected the trolleybus system. Mr. Silvers, replying, commented on some of the changes during the past ten years, and said that the Midland Association had contributed to the strong position held by municipal transport to-day.

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**Sir Henry Fowler,** chief mechanical engineer of the L.M.S., has been appointed assistant to the vice-president for works as from January 1, next year. The company intends that Sir Henry's wide knowledge and experience shall be devoted mainly to research and development. He will take charge of the laboratories and the central testing bureau.

**Mr. G. F. Nayler,** electrical engineer and tramways manager at Nelson, has been asked by the Electricity and Light Railways Committee to resign. Mr. Nayler has been in the service of the Corporation for many years, and has been responsible for considerable development in the electrical undertaking, which now supplies current to a number of towns.

**Mr. Percy E. Rycroft** has resigned his position with Babcock and Wilcox, Ltd., to accept the appointment of general engineer and manager of Great Yarmouth Corporation electricity undertaking. He succeeds Mr. P. G. Campling, who was recently elected district engineer for East England under the Central Electricity Board. There were 93 applicants, and Mr. Rycroft's election was unanimous.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | Nov. 4 | 558 | 595 | + 37 | 31 | 18,226 | — 76 |
| „ Motor Buses ... | „ 4 | 260 | 319 | + 59 | 31 | 9,317 | + 1,731 |
| „ Total ... ... | „ 4 | 818 | 914 | + 96 | 31 | 27,543 | + 1,655 |
| Aberdeen Corp. ... | Oct. 29 | 4,358 | 4,431 | + 73 | 21½ | 117,705 | + 2,258 |
| Ashton-u-Lyne Corp. | Nov. 1 | 893 | 843 | — 50 | 31 | 26,376 | — 2,182 |
| „ Motor Buses ... | „ 1 | 458 | 486 | + 28 | 31 | 15,399 | + 178 |
| „ Trolley Buses ... | „ 1 | 288 | 262 | — 24 | 31 | 8,057 | — 635 |
| „ Total ... ... | „ 1 | 1,637 | 1,591 | — 46 | 31 | 49,832 | — 2,639 |
| Ayr Corporation ... | „ 1 | 437 | 412 | — 25 | 24 | 15,761 | — 1,249 |
| Barrow Corporation... | „ 1 | 499 | 540 | + 41 | 31 | 18,085 | — 1,109 |
| „ Motor Buses ... | „ 1 | 364 | 371 | + 7 | 31 | 12,958 | + 642 |
| „ Total ... ... | „ 1 | 863 | 911 | + 48 | 31 | 31,043 | — 467 |
| Belfast City ... ... | Oct. 31 | 11,068 | 11,512 | + 444 | 30½ | 352,841 | + 10,873 |
| „ Motor Buses ... | „ 31 | 1,127 | 1,371 | + 244 | 30½ | 40,091 | + 8,112 |
| „ Total ... ... | „ 31 | 12,195 | 12,883 | + 688 | 30½ | 392,932 | + 18,985 |
| Birkenhead Corp. ... | Nov. 2 | 1,534 | 1,443 | — 91 | 31 | 47,311 | — 5,513 |
| „ Motor Buses ... | „ 2 | 3,129 | 3,675 | + 546 | 31 | 117,464 | + 1,883 |
| „ Total ... ... | „ 2 | 4,663 | 5,118 | + 455 | 31 | 164,775 | — 3,630 |
| Birmingham Corp. ... | Oct. 28 | 27,541 | 26,038 | — 1,503 | 30 | 785,460 | — 31,036 |
| „ Motor Buses ... | „ 28 | 13,466 | 16,339 | + 2,873 | 30 | 467,466 | + 75,423 |
| „ Trolley Buses ... | „ 28 | 579 | 539 | — 40 | 30 | 16,187 | — 409 |
| „ Total ... ... | „ 28 | 41,586 | 42,916 | + 1,330 | 30 | 1,269,113 | + 43,978 |
| Blackburn Corp. ... | „ 29 | 1,903 | 1,736 | — 167 | 30½ | 55,525 | — 5,108 |
| „ Motor Buses ... | „ 29 | Nil | 314 | + 314 | 30½ | 9,767 | + 9,767 |
| „ Total ... ... | „ 29 | 1,903 | 2,050 | + 147 | 30½ | 65,092 | + 4,659 |
| Bradford Corporation | Nov. 1 | 10,055 | 9,015 | — 1,040 | ... | ... | ... |
| „ Motor Buses ... | „ 1 | 3,292 | 3,147 | — 145 | ... | ... | ... |
| „ Trolley Buses ... | „ 1 | 1,050 | 1,953 | + 903 | ... | ... | ... |
| „ Miscellaneous ... | „ 1 | 410 | 361 | — 49 | ... | ... | ... |
| „ Total ... ... | „ 1 | 14,807 | 14,476 | — 331 | 31 | 443,397 | — 17,731 |
| Brighton Corporation | „ 2 | 2,288 | 2,198 | — 90 | 30½ | 88,219 | + 1,701 |
| Burnley Corporation... | „ 1 | 3,307 | 2,740 | — 567 | — | ... | — |
| „ Motor Buses ... | „ 1 | 653 | 747 | + 94 | — | ... | — |
| „ Total ... ... | „ 1 | 3,960 | 3,487 | — 473 | ... | ... | — |
| Burton-on-Trent Corp. | Oct. 19 | 824 | 891 | + 67 | 29 | 23,948 | + 943 |
| Bury Corporation ... | Nov. 2 | 1,912 | 1,647 | — 265 | 30½ | 54,710 | — 8,622 |
| „ Motor Buses ... | „ 2 | 746 | 1,402 | + 656 | 30½ | 36,965 | + 21,270 |
| „ Total ... ... | „ 2 | 2,658 | 3,049 | + 391 | 30½ | 91,675 | + 13,248 |
| Cardiff Corporation ... | „ 1 | 7,661 | 7,713 | + 52 | 30½ | 240,985 | + 2,180 |
| Chester Corporation ... | „ 2 | 406 | Nil | — 406 | 31 | Nil | — 13,699 |
| „ Motor Buses ... | „ 2 | Nil | 667 | + 667 | 31 | 20,780 | + 20,780 |
| „ Total ... ... | „ 2 | 406 | 667 | + 261 | 31 | 20,780 | + 7,081 |
| Chesterfield Corp. ... | „ 3 | 1,962 | 1,995 | + 33 | 31 | 60,254 | + 1,076 |
| Colchester Corp. ... | „ 5 | 547 | 561 | + 14 | 32 | 19,598 | + 1,956 |
| Colne Corporation ... | „ 5 | 635 | 648 | + 13 | 31 | 22,068 | — 387 |
| Coventry Corporation | „ 2 | 2,190 | 1,812 | — 378 | 31 | 60,246 | — 5,771 |
| „ Motor Buses ... | „ 2 | 1,728 | 1,806 | + 78 | 31 | 55,450 | + 5,966 |
| „ Total ... ... | „ 2 | 3,918 | 3,618 | — 300 | 31 | 115,696 | + 195 |
| Darlington Corp. ... | „ 1 | 1,010 | 1,027 | + 17 | 30½ | 32,711 | + 2,466 |
| Derby Corporation ... | „ 1 | 2,467 | 2,364 | — 103 | 31 | 75,663 | — 2,520 |
| „ Motor Buses ... | „ 1 | 798 | 922 | + 124 | 31 | 28,479 | + 5,709 |
| „ Total ... ... | „ 1 | 3,265 | 3,286 | + 21 | 31 | 104,142 | + 3,189 |
| Dover Corporation ... | „ 1 | 356 | 375 | + 19 | 31 | 13,803 | + 466 |
| Dundee Corporation... | Oct. 21 | 2,610 | 2,617 | + 7 | 22½ | 58,322 | — 1,973 |
| „ Motor Buses ... | „ 21 | 840 | 1,192 | + 352 | 22½ | 25,943 | + 6,695 |
| „ Total ... ... | „ 21 | 3,450 | 3,809 | + 359 | 22½ | 84,265 | + 4,722 |
| East Ham Corp. ... | Nov. 1 | 2,370 | 2,210 | — 160 | 30½ | 70,445 | + 41 |
| Edinburgh Corp. ... | Oct. 25 | 14,284 | 14,536 | + 252 | 23½ | 350,851 | + 6,074 |
| „ Motor Buses ... | „ 25 | 3,441 | 3,645 | + 204 | 23½ | 89,036 | + 6,902 |
| „ Total ... ... | „ 25 | 17,725 | 18,181 | + 456 | 23½ | 439,887 | + 12,976 |
| Exeter Corporation ... | Nov 5 | 817 | 730 | — 87 | 32 | 25,633 | — 2,349 |
| „ Motor Buses ... | „ 5 | 194 | 415 | + 221 | 32 | 10,807 | + 5,950 |
| „ Total .. ... | „ 5 | 1,011 | 1,145 | + 134 | 32 | 36,440 | + 3,601 |
| Glasgow Corporation... | Oct. 25 | 45,780 | 44,410 | — 1,370 | 21 | 911,346 | — 6,960 |
| „ Motor Buses ... | „ 25 | 6,700 | 10,438 | + 3,738 | 21 | 183,909 | + 68,608 |
| „ Total ... ... | „ 25 | 52,480 | 54,848 | + 2,368 | 21 | 1,095,255 | + 61,708 |
| Gloucester Corp. ... | „ 29 | 627 | 686 | + 59 | 30½ | 21,936 | + 4,234 |
| Grimsby Corporation | Nov. 1 | 1,397 | 1,567 | + 170 | 31 | 49,841 | + 5,059 |
| Halifax Corporation | Oct. 28 | 4,653 | 5,120 | + 467 | 30½ | 156,627 | + 16,865 |
| Huddersfield Corp. ... | Nov. 1 | 6,435 | 6,428 | — 7 | 31 | 198,386 | — 1,862 |
| Hull Corporation ... | „ 1 | 6,222 | 5,761 | — 461 | 31 | 178,628 | — 7,826 |
| „ Motor Buses ... | „ 1 | 1,453 | 1,761 | + 308 | 31 | 50,247 | + 7,793 |
| „ Total ... ... | „ 1 | 7,675 | 7,522 | — 153 | 31 | 228,275 | — 33 |
| Ilford Corporation ... | „ 1 | 1,511 | 1,530 | + 19 | 30½ | 46,758 | + 623 |
| Ipswich Corp. Trol.Bus | „ 1 | 1,318 | 1,373 | + 55 | 30½ | 42,217 | + 2,263 |
| Isle of Thanet ... | Oct. 29 | 406 | 386 | — 20 | 43½ | 37,820 | — 4,526 |
| Kilmarnock Corp. ... | Nov. 1 | 487 | 511 | + 24 | 24½ | 12,111 | + 538 |
| Lancashire Un. ... | Oct. 19 | 2,309 | 2,130 | — 179 | 41½ | 88,977 | — 5,336 |
| „ Motor Buses ... | „ 19 | 4,820 | 5,322 | + 502 | 41½ | 208,635 | + 25,944 |
| Leeds Corporation ... | Nov. 1 | 19,649 | 19,989 | + 340 | 30½ | 615,754 | + 10,040 |
| Leicester Corp. ... | „ 1 | 8,595 | 8,674 | + 79 | 31 | 259,264 | — 63 |
| Lincoln Corp. ... | „ 2 | 899 | 857 | + 42 | 31 | 29,316 | + 220 |
| Liverpool Corp. ... | „ 1 | 27,043 | 26,385 | — 658 | 30½ | 826,779 | — 14,705 |
| „ Motor Buses ... | „ 1 | 2,968 | 3,265 | + 297 | 30½ | 101,822 | + 14,686 |
| „ Total ... ... | „ 1 | 30,011 | 29,650 | — 361 | 30½ | 928,601 | — 19 |
| London County Coun. | „ 5 | 83,584 | 82,590 | — 994 | 31½ | 2,591,289 | — 26,121 |
| Luton Corporation ... | Oct. 29 | 389 | 385 | — 4 | 30½ | 13,002 | + 280 |
| Maidstone Corp. ... | „ 30 | 142 | Nil | — 142 | 30½ | Nil | — 6,575 |
| „ Motor Buses ... | „ 30 | 332 | 253 | — 79 | 30½ | 8,579 | — 940 |
| „ Trolley Buses ... | „ 30 | 290 | 547 | + 257 | 30½ | 18,937 | + 9,433 |
| „ Total ... ... | „ 30 | 764 | 800 | + 36 | 30½ | 27,516 | + 1,918 |
| Manchester Corp. ... | Nov. 1 | 35,189 | 32,445 | — 2,744 | 31 | 991,785 | — 90,499 |
| „ Motor Buses ... | „ 1 | 4,841 | 9,191 | + 4,350 | 31 | 269,525 | + 115,629 |
| „ Total ... ... | „ 1 | 40,030 | 41,636 | + 1,606 | 31 | 1,261,310 | + 25,130 |
| Middlesbrough Corp. | Oct. 28 | 1,065 | 959 | — 106 | 30½ | 31,131 | — 3,402 |
| „ Motor Buses ... | „ 28 | 540 | 527 | — 13 | 30½ | 17,160 | + 1,102 |
| „ Total ... ... | „ 28 | 1,605 | 1,486 | — 119 | 30½ | 48,291 | — 2,300 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks. | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Tv.Corp. | Nov. 1 | 9,428 | 8,386 | — 1,042 | 30½ | 265,904 | — 46,022 |
| „ Motor Buses ... | „ 1 | 1,830 | 3,559 | + 1,729 | 30½ | 99,616 | + 36,258 |
| „ Total ... ... | „ 1 | 11,258 | 11,945 | + 687 | 30½ | 365,520 | — 9,764 |
| Newport Corporation | Oct. 25 | 1,621 | 1,103 | — 558 | 30 | 43,280 | — 6,703 |
| „ Motor Buses ... | „ 25 | 732 | 1,291 | + 579 | 30 | 29,420 | + 6,688 |
| „ Total ... ... | „ 25 | 2,353 | 2,394 | + 41 | 30 | 72,700 | — 15 |
| Northampton Corp. ... | „ 31 | 1,102 | 778 | — 324 | 30½ | 30,729 | — 3,475 |
| „ Motor Buses ... | „ 31 | 652 | 1,050 | + 398 | 30½ | 25,508 | + 4,844 |
| „ Total ... ... | „ 31 | 1,754 | 1,828 | — 74 | 30½ | 56,237 | + 1,369 |
| Nottingham Corp. ... | „ 30 | 6,406 | 5,687 | — 719 | 30½ | 176,595 | — 26,507 |
| „ Motor Buses ... | „ 30 | 2,718 | 3,610 | + 892 | 30½ | 103,826 | + 31,476 |
| „ Trolley Buses ... | „ 30 | 612 | 1,198 | + 586 | 30½ | 36,764 | + 18,570 |
| „ Total ... ... | „ 30 | 9,736 | 10,495 | + 759 | 30½ | 317,185 | + 23,539 |
| Oldham Corporation | Nov. 1 | 3,650 | 3,441 | — 209 | 32 | 107,065 | — 6,948 |
| „ Motor Buses ... | „ 1 | 1,935 | 1,875 | — 60 | 32 | 63,255 | — 1,169 |
| „ Total ... ... | „ 1 | 5,585 | 5,316 | — 269 | 32 | 170,320 | — 8,117 |
| Plymouth Corp. ... | „ 1 | 3,508 | 3,149 | — 359 | 30½ | 113,684 | — 5,145 |
| „ Motor Buses ... | „ 1 | 2,041 | 2,732 | + 691 | 30½ | 77,387 | + 16,703 |
| „ Total ... ... | „ 1 | 5,549 | 5,881 | + 332 | 30½ | 191,071 | + 11,558 |
| Portsmouth Corp. ... | „ 1 | 3,661 | 3,269 | — 392 | 31 | 135,012 | — 12,687 |
| „ Motor Buses ... | „ 1 | 1,790 | 2,807 | + 1,017 | 31 | 105,939 | + 40,770 |
| „ Total ... ... | „ 1 | 5,451 | 6,076 | + 625 | 31 | 240,951 | + 28,083 |
| Preston Corporation... | Oct. 29 | 1,670 | 1,635 | — 35 | 30½ | 50,973 | — 2,153 |
| „ Motor Buses ... | „ 29 | 504 | 514 | + 10 | 30½ | 15,841 | + 781 |
| „ Total ... ... | „ 29 | 2,174 | 2,149 | — 25 | 30½ | 66,814 | — 1,372 |
| Rawtenstall Corp. ... | „ 26 | 847 | 660 | — 187 | 29½ | 19,361 | — 5,887 |
| „ Motor Buses ... | „ 26 | 509 | 717 | + 208 | 29½ | 20,895 | + 5,214 |
| „ Total ... ... | „ 26 | 1,356 | 1,377 | + 21 | 29½ | 40,256 | — 673 |
| Reading Corporation | „ 30 | 1,499 | 1,392 | — 107 | 31 | 44,370 | — 2,291 |
| „ Motor Buses ... | „ 30 | 923 | 1,054 | + 131 | 31 | 31,201 | + 2,980 |
| „ Total ... ... | „ 30 | 2,422 | 2,446 | + 24 | 31 | 75,571 | + 689 |
| Rochdale Corp. ... | Nov. 1 | 2,787 | 2,283 | — 504 | ... | 84,209 | — 6,280 |
| „ Motor Buses ... | „ 1 | 1,560 | 2,176 | + 616 | ... | 49,445 | + 636 |
| „ Total ... ... | „ 1 | 4,347 | 4,459 | + 112 | ... | 133,654 | — 5,644 |
| Rotherham Corp. ... | „ 3 | 2,768 | 3,022 | + 254 | 31 | 86,762 | + 2,283 |
| Salford Corporation ... | „ 2 | 11,468 | 11,114 | — 354 | 30½ | 344,475 | — 1,803 |
| Sheffield Corp. ... | „ 1 | 21,245 | 20,150 | — 1,095 | 29½ | 629,567 | — 21,661 |
| Southampton Corp. ... | Oct. 29 | 3,310 | 3,333 | + 23 | 31 | 107,773 | + 2,252 |
| „ Motor Buses ... | „ 29 | 869 | 855 | — 14 | 31 | 26,940 | + 2,785 |
| „ Total ... ... | „ 29 | 4,179 | 4,188 | + 9 | 31 | 134,713 | + 5,037 |
| Southend-on-Sea Corp. | „ 29 | 1,821 | 1,801 | — 20 | 30½ | 70,101 | — 3,504 |
| „ Trolley Buses ... | „ 29 | 196 | 246 | + 50 | 30½ | 10,077 | + 3,145 |
| „ Total ... ... | „ 29 | 2,017 | 2,047 | + 30 | 30½ | 80,178 | — 359 |
| Southport Corp. ... | Nov. 1 | 1,194 | 1,233 | + 39 | 30½ | 42,669 | — 641 |
| „ Motor Buses ... | „ 1 | 321 | 356 | + 35 | 30½ | 13,678 | + 1,197 |
| „ Total ... ... | „ 1 | 1,515 | 1,589 | + 74 | 30½ | 56,347 | + 556 |
| St. Helens Corp. ... | Oct. 28 | 2,053 | 2,128 | + 75 | 30½ | 62,030 | + 2,980 |
| Sunderland Corp. ... | Nov. 4 | 2,383 | 2,122 | — 261 | 31 | 76,467 | — 679 |
| „ Motor Buses ... | „ 4 | 235 | 718 | + 483 | 31 | 19,117 | + 12,079 |
| „ Total ... ... | „ 4 | 2,618 | 2,840 | + 222 | 31 | 95,584 | + 11,400 |
| Swindon Corp. .. | Oct. 29 | 821 | 963 | + 142 | 30½ | 30,194 | + 5,709 |
| Wallasey Corp. ... | Nov. 1 | 1,184 | 1,160 | — 24 | 30½ | 38,825 | — 3,220 |
| „ Motor Buses ... | „ 1 | 1,867 | 2,058 | + 191 | 30½ | 74,083 | + 6,987 |
| „ Total ... ... | „ 1 | 3,051 | 3,218 | + 167 | 30½ | 112,908 | + 3,767 |
| Walsall Corporation... | Oct. 26 | 3,435 | 3,863 | + 428 | 30 | 105,055 | + 2,410 |
| Walthamstow Corp. ... | Nov. 1 | 2,436 | 2,438 | + 2 | 30½ | 76,443 | — 460 |
| Warrington Corp. ... | Oct. 30 | 890 | 910 | + 20 | 31 | 27,573 | + 217 |
| „ Motor Buses ... | „ 30 | 461 | 538 | + 77 | 31 | 15,612 | + 1,727 |
| „ Total ... ... | „ 30 | 1,351 | 1,448 | + 97 | 31 | 43,185 | + 1,944 |
| West Ham Corp. ... | „ 30 | 6,275 | 5,959 | — 316 | 30½ | 184,104 | — 1,091 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | Nov. 2 | 2,732 | 2,313 | — 419 | 31 | 76,051 | — 11,198 |
| „ Trolley Buses ... | „ 2 | 3,365 | 3,648 | + 283 | 31 | 108,079 | + 4,320 |
| „ Total ... ... | „ 2 | 6,097 | 5,961 | — 136 | 31 | 184,130 | — 6,878 |
| York Corporation ... | Oct. 29 | 1,008 | 907 | — 101 | 31 | 32,158 | — 660 |
| „ Motor Buses ... | „ 29 | 440 | 521 | + 81 | 31 | 15,921 | + 3,757 |
| „ Trolley Buses ... | „ 29 | 65 | Nil | — 65 | 31 | Nil | — 1,700 |
| „ Total ... ... | „ 29 | 1,513 | 1,428 | — 85 | 31 | 48,079 | + 1,397 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or M | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Nov. 4 | £86,751 | £82,019 | 44 w | £3,601,726 | — £193,550 |
| Brazilian Traction $ | Sept. | 4,225,416 | 3,906,162 | 9 m | 36,036,347 | — 865,449 |
| British Columbia $ | Sept. | 1,169,278 | 1,206,579 | 3 m | 3,597,208 | + 102,457 |
| Buenos Aires Lacroze | Nov. 2 | 12,637 | 12,659 | 18 w | 197,516 | — 12,380 |
| Burma E. Sup. Co. Rs. | Sept. | 59,467 | 65,852 | 2 m | 132,270 | + 11,494 |
| Calcutta ... Rs. | Nov. 1 | 111,664 | 98,271 | 43½ w | 4,797,321 | — 723,006 |
| Cape Town ... ... | Sept. | 26,579 | 24,295 | ... | ... | ... |
| Carthagena & Herrerias | Oct. | 1,953 | 559 | 10 m | 7,851 | — 2,852 |
| Durban Corporation | Sept. | 22,371 | 21,156 | 2 m | 46,227 | — 1,763 |
| East India ... ... | Oct. | 4,078 | 3,809 | 3 m | 11,488 | — 868 |
| Kalgoorlie ... ... | July | 1,664 | 1,776 | 7 m | 11,662 | + 137 |
| Madras (2 weeks) Rs. | Oct. 31 | 41,430 | 41,082 | 42 w | 927,614 | + 48,878 |
| Para ... ... | Sept. | 15,210 | 12,196 | 10 m | 143,500 | — 5,026 |
| Port Elizabeth ... | Sept. | 7,190 | 6,670 | ... | ... | ... |
| Rangoon ... Rs. | Sept. | 122,850 | 147,775 | 9 m | 1,345,030 | + 267,189 |
| Shanghai ... $ | Sept. | 365,828 | 418,059 | 9 m | 3,097,758 | + 101,709 |
| Singapore ... ...$ | Sept. | 126,000 | 140,000 | 12 m | 1,650,000 | + 179,000 |
| Winnipeg ... ...$ | Sept. | 518,521 | 484,609 | 9 m | 4,656,233 | — 194,943 |

## RAILWAY RECEIPTS.

| 44th Week ended Nov. 2nd | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 193,000 | — 12,000 | 330,000 | — 21,000 | 523,000 | — 33,000 | -1,203,000 |
| L.M.S.R. | 448,000 | — 23,000 | 758,000 | — 106,000 | 1,206,000 | — 129,000 | -4,155,000 |
| L.N.E.R. | 307,000 | — 12,000 | 708,000 | — 35,000 | 1,015,000 | — 47,000 | -2,751,000 |
| S.R. | 268,000 | — 9,000 | 121,000 | — 1,000 | 389,000 | — 10,000 | — 518,000 |
| Totals | 1,216,000 | — 56,000 | 1,917,000 | — 163,000 | 3,133,000 | — 219,000 | -8,627,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or − | Aggregate. 1930. | + or − |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Nov. 1 | 290,600 | 305,600 | + 15,000 | 13,278,900 | + 692,600 |
| Lond. & Sub. Group | „ 1 | 42,800 | 44,800 | + 2,000 | 1,956,400 | + 108,200 |
| Metropolitan Railway | „ 1 | 36,900 | 35,500 | — 1,400 | 1,605,900 | + 12,200 |
| Liverpool Overhead | „ 2 | 1,611 | 1,313 | — 298 | 68,737 | — 5,922 |
| Mersey Railway ... | „ 1 | 4,699 | 4,501 | — 198 | 199,348 | + 3,652 |

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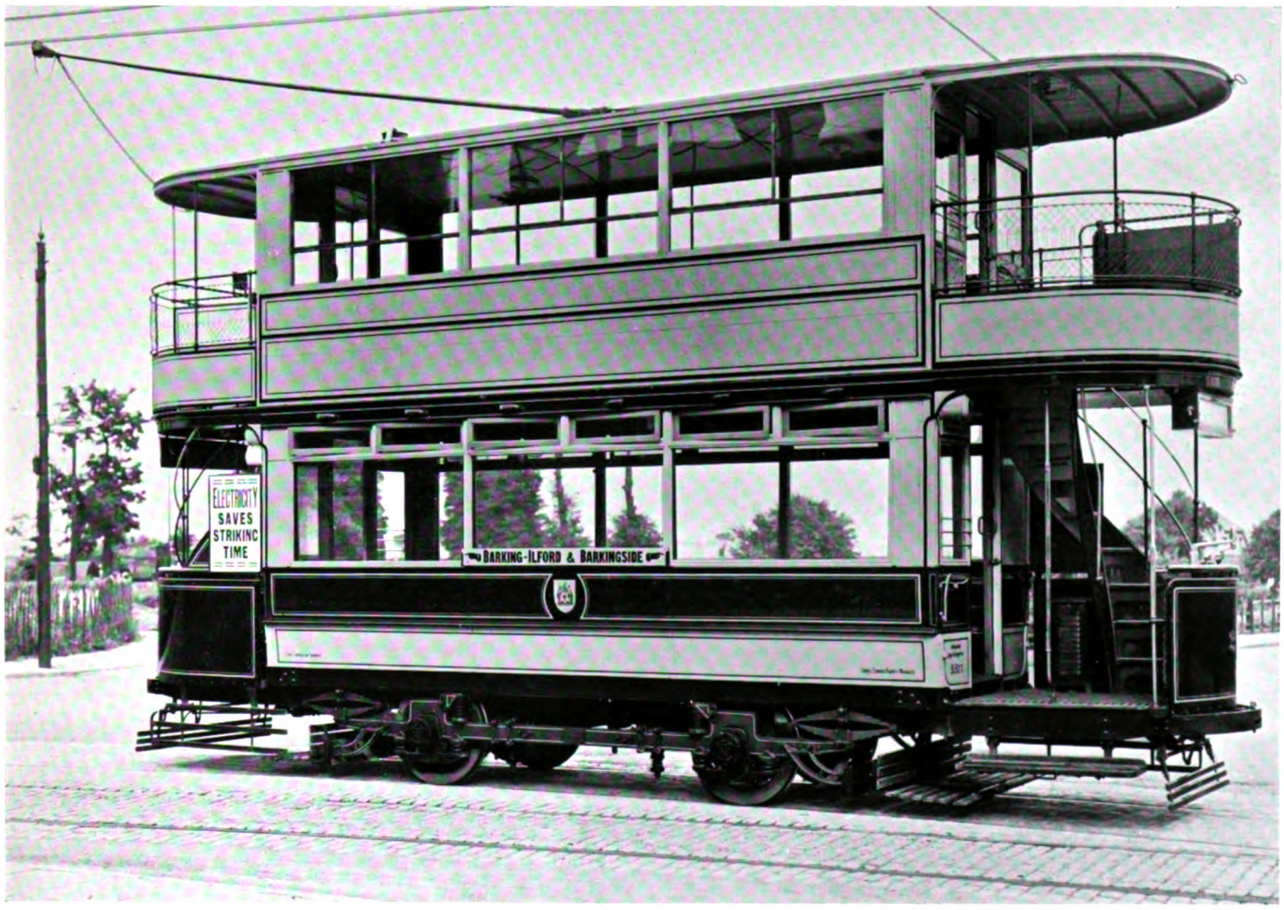
THE Tramway & Railway World
WITH OMNIBUS & COACH SECTION
Founded 1892 LONDON, NOVEMBER 13, 1930 VOL. LXVIII

# IMPROVEMENTS IN AN ILFORD CORPORATION CAR.

The accompanying photographs show one of the new cars the Brush Electrical Engineering Co., Ltd., has built for Ilford Corporation to the specification of Mr. L. E. Harvey, their tramways engineer and general manager. The tramways of Ilford, an outer London area, occupy a rather remarkable position, as the Tramways Committee have for many years been able to record a net profit when other Metropolitan undertakings have not proved so successful.




New Ilford Corporation Tramway Car.

That achievement has been effected in the face of keen omnibus competition, and without the aid of through-running with the cars of other East London authorities or those of the L.C.C. Operating as a self-contained unit the Ilford system carries passengers comparatively short distances, and it is because of this fact that longitudinal seats have been retained in the lower saloon of the car shown in one of the illustrations. It is found that these seats facilitate loading and unloading and give more room for standing passengers. The seats, however, are not in the uncomfortably bare form of the pre-war era; they are in three lengths, and have been supplied by G. D. Peters & Co., Ltd. They are well-sprung and are covered in moquette. Mr. Harvey would prefer leather upholstery, which is more lasting though costly. In the top-deck saloon, which does not extend over the platform canopies, he has indulged his preference for real leather as a covering for the seats, which are of the transverse type. As the padded leather back is reversed through slots in the seat, the effective width of the seat is increased by 2 in. and makes less obstruction in the gangway.

In the issue of the TRAMWAY AND RAILWAY WORLD for July 17, Mr. Harvey reported the pronounced success of his seven years' trial of roller axle bearings of the Hoffman Manufacturing Co., of Chelmsford.

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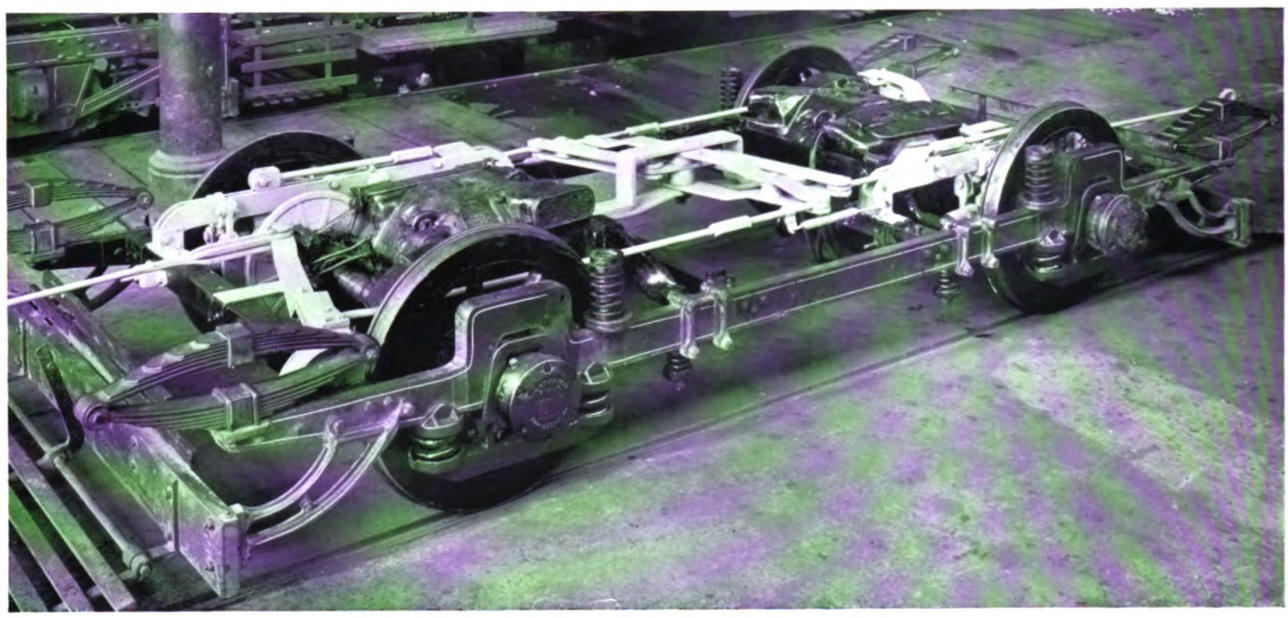
The experiment was on a scale extensive enough, and for a period long enough to provide reliable data. Out of twenty modern cars ten were equipped with Hoffman roller axle bearings, and ten had ordinary gun-metal bearings with thrust plates. These cars are similar to the car shown in the accompanying illustrations, and they have a four-wheel truck of the Peckham Truck & Engineering Company with bodies by the Brush Electrical Engineering Company, equipments by the British Thomson-Houston Company, and fitted with car meters of C. & H. make. Two years' working served to show a saving of 8 per cent. in current for the roller axle bearings, the total savings on power, materials and labour, amounting to £31 per car per annum. The prime cost of the roller bearings was saved in about three years. Mr. Harvey thereupon fitted roller bearings to the other ten cars, and he has had no reason to regret that action. Two later types of Hoffman bearings offer still further advantages. The Ilford manager also advocates the use of roller armature bearings in new motors, on the grounds that there is a constant air gap between the armature coils and the pole pieces and that pinions have more constant mesh into gears.

As the result of the attention paid to trolley heads at Ilford, there are, on the average, not more than six de-wirements in a year. Lengthy experiments made in conjunction with the Hoffman Company have resulted in the trolley head being fitted, as on this car, with ball-bearings in the wheel as well as on the spindle. The life of the wheels is about 10,000 miles, and the hubs outlast two wheels. The balls and races of the wheel are insulated, in order to prevent them becoming pitted with the current, with consequent rapid wear. The insulation is effected by a spring-actuated carbon brush which bears on each side of the hub of the wheel.

Ingenuity is also shown in an improvement of the method of supporting the top of the hand-brake spindle to the top dash-rail. By adopting a ball-bearing, wear and rattling and the risk of grease being rubbed off by passengers' clothing are avoided.

The Ilford truck is fitted with the toggle brake, a German invention, now made in this country at the Brush Company's works, and marketed by the Peckham Truck & Engineering Co. On the Continent and in this country 2,500 Peckham trucks have this hand-operated brake.

There are several forms of the toggle brake, but the type adopted at Ilford consists of two steel discs about 20 in. diameter and 8 in. apart, one of which is cast integral with the wheel centre and the other is keyed or pressed on to the axle. Between these discs are situated four friction shoes or pads which are forced apart and pressed upon the discs by means of toggle levers. The leverage is high and all the parts are heavily built. A pull of 36 lb. on the brake handle gives a pressure of 17,600 lb. on the eight brake pads, or 73 lb. per sq. in. of pad surface. A 64-seat top-cover car can be pulled up with no exertion in about 40 ft., a retardation of 5–6 ft. per second per second being obtained on a dry rail without the aid of sand. Apart from its merits of power and reliability the toggle brake saves the cost of brake-block renewals, the labour of changing them and the nightly inspection and adjustment. In addition, the rolled skin of the tyre does not suffer abrasion from a brake-block and road grit. Consequently the surface of the tyre becomes glass hard and its life is prolonged. As the flange of the wheel is not worn down by brake blocks, its shape is better preserved. Some idea of the mechanism may be gathered from the white-painted portion of the accompanying illustration.



Peckham Pendulum Truck with Toggle Brake.

A notable advance has been effected in the upper saloon windows. An easily-operated sliding type, known as the new Beclawatt tramway window, has been evolved with the co-operation of Beckett, Laycock & Watkinson, Ltd. It lessens the total weight of the saloon by at least 5 cwt., as the double-side casing is done away with, with the result that from 4½ in. to 5 in. are added to the interior width of the saloon. More comfortable seating and a wider gangway are thus provided, as previously mentioned. This window can be made in a metal frame of required size to fill a given window space, or can be built into the top cover. It is easily operated by the passenger, and when closed it is rain and draught proof. Whether open or closed, there is no rattle. The window can be adapted to existing saloons, but to secure the full benefit of additional width in the saloon, some constructional alteration is necessary.

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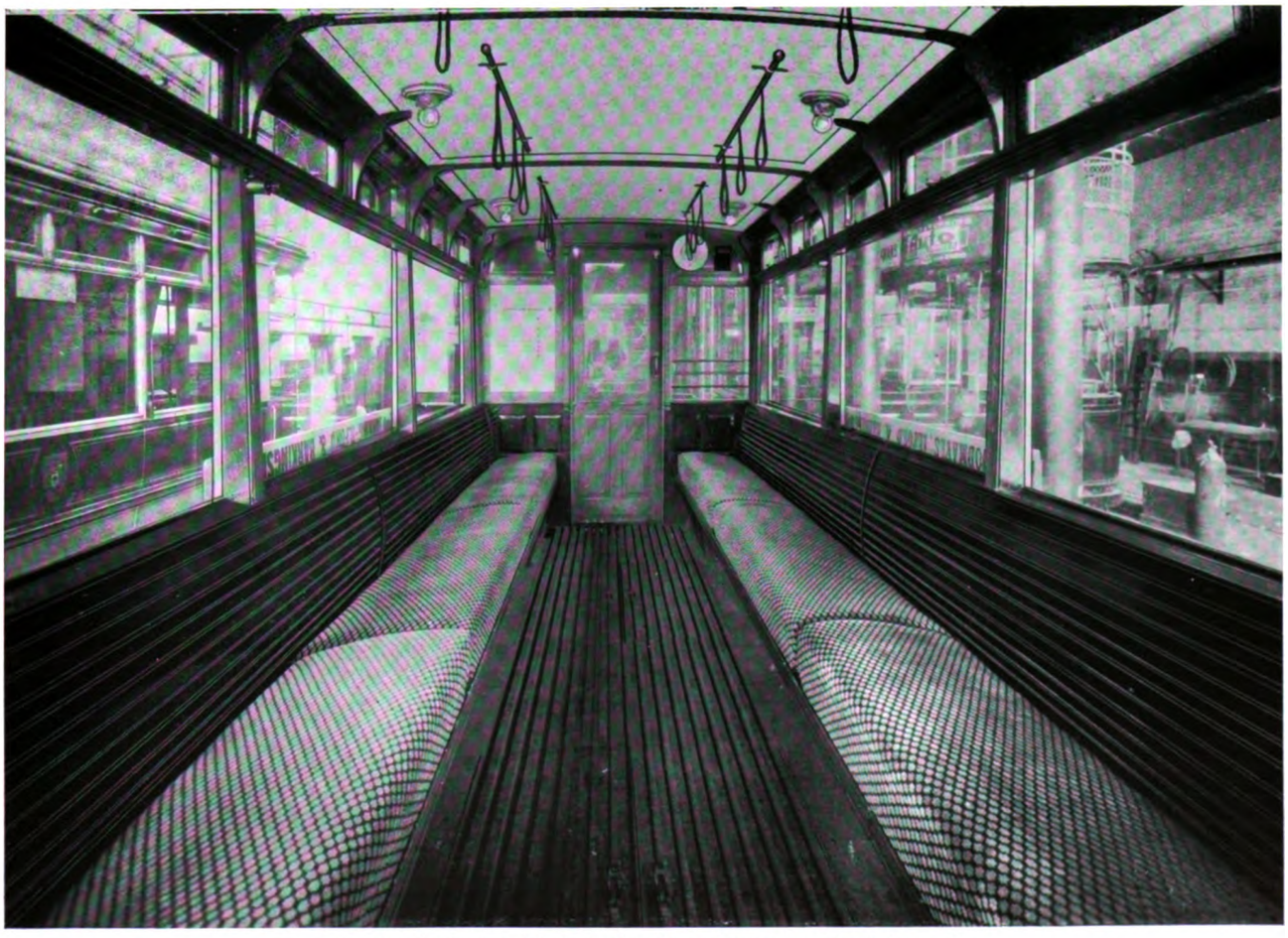
Upper Saloon of Ilford Car with Sliding Windows and Leather Seats.



Lower Saloon with Longitudinal Seats in Three Lengths.

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Ventilation has received careful attention. The lower saloon has an "Anemostat" exterior funnel facing the direction of motion of the car, collecting air and passing it through a tube to an interior distributing funnel—giving no draught. In addition to its easily-opened windows the top deck has the "Flettner" ventilators in the roof cover. Both ventilators are supplied by the Peckham Truck & Engineering Co. The "Flettner"—a Continental invention—was described and illustrated in this journal of August 14 last.

An improved type of "Numa" air bell is provided. It is supplied by the Equipment & Engineering Co. In place of metal piping, it has piping of 5-ply rubber, which is very durable, cheap and easy of renewal. The passenger-operated push rings the bell at both ends of the car, so that the conductor is warned, as well as the motorman. The pushes are in the most convenient situation, namely the side pillars. Gas-filled lamps are used. Hand rails and stanchions are of chromium-plating, the only cleaning necessary being an occasional rub with a soft dry rag. In order to give the greatest possible safety to the passenger, hard wood is being experimentally used for step treads. Examination of the car shows that special attention has been given to details, with the result that considering the local conditions it is designed to meet, the Ilford public have a car that is thoroughly up-to-date, attractive and very comfortable.

## ENLISTING THE SUPPORT OF THE EMPLOYEES.

"The Man on the Platform—Our Greatest Potential Asset," was the title of an address given at the American Electric Railway Convention by Mr. J. N. Shannahan, president of the Omaha Street Railway, and chairman of the advisory council of the Association. The author's account of what the company has accomplished with the aid of its employees should interest tramway operators everywhere. Going to Omaha at the beginning of 1928 he found the company's concessions were about to expire, a lack of sympathy from the employees, and a feeling on the part of the public that anything they could do to harrass the company was a just retribution for past sins. A year and a half earlier the terms of a new concession had been rejected by a referendum of the citizens by 22,000 to 14,000. As a first step the new president proceeded to put the company's house in order by holding conferences with the employees, who were invited to take to the public the case for the granting of a new concession. The terms thereof were in due course agreed with the City Council, and the citizens on a vote approved by 64,000 to 16,000. Another urgent problem was one of re-routing, in order to save cars and reduce expenses. The management again made the round of the depots and shops, and although the men realised that the plan meant fewer journeys and less work, they also recognised that the reductions must be made if the company was to survive. Again the men favourably responded. Next the Company had to ask for an increase in fares from the State Commission, and the men were informed that the public must be convinced that the request was just and fair, as no decision would stand unless it had the support of the public. The employees took the case to their patrons, with the result that the order was accepted. Mr. Shannahan concluded thus: "If you ignore the help that you can get from your own people, and above all from the men on your car platforms, you deserve to fail."

## CANADIAN TRAMWAY UNDERTAKINGS.

### Progress of the Industry.

Last year witnessed the largest increase in passenger revenue in the history of the Canadian electric railways, or tramways, as they are described in this country, and in the last fifteen years the revenue has increased over 100 per cent. These are two satisfactory facts that emerge from an examination of the 40-page publication entitled "Electric Railway Statistics" issued by Mr. Eustace Smith, Jr., secretary of the Canadian Electric Railway Association (35, Yonge Street, Toronto). It is the fourth issue since 1927, and is in the nature of an annual report.

By means of charts, diagrams and explanatory matter the position of the industry in Canada is shown very clearly. These charts formed part of the Association's exhibit at the twenty-sixth annual convention held in Ottawa on September 16, 17, 18 and 19, and it is characteristic of the Canadian belief in publicity that the Association recommends its member companies to use reproductions for propaganda purposes, both in their own publicity and in the local press. They are convincing in their presentation of certain aspects of street-car transportation and are equally applicable to tramways in this country.

In 1929 the amount invested in Canadian electric railways was $241,023,115, an increase of $10,328,857 over 1928. In 1901 the total was only $40,553,170, and the continued increase shows the stability of the industry. The report mentions that there are occasional failures or services being superseded by motor omnibus services, but these are comparatively rare and in each case there have been sufficient economic reasons to justify the abandonment of the electric line. In the city services there have been no appreciable changes which would reduce the total miles of track. Last year 2,478 miles of single track were operated, and 4,143 cars were in service. Profits, however, have not been very great in recent years. The latest figures available, those for 1928, show the total net income as $2,920,124, as against $3,229,943 in 1927 and $2,361,750 in 1926. It is recorded, however, that since April last the majority of the street railways have experienced decreases on the 1929 peak, although they were still above the 1928 level

The following table, compiled from particulars given in the report, shows some of the operating results:—

| | | 1928 | 1929 |
|---|---|---|---|
| Total passenger revenue .. .. | $ | 50,164,164 | 52,302,474 |
| Passenger revenue per track mile | $ | 20,050 | 21,107 |
| Operating expenses per track mile | $ | 16,438 | 16,102 |
| Passenger revenue per car mile (cents) | | 39 | 38·81 |
| Operating expenses per car mile | ,, | 30 | 29 |

Passenger revenue per mile of single track is now 2·58 times as great as it was in 1900, but the trend of operating expenses shows a greater spread, the present cost per track mile being 3·07 times as great as the 1900 level. An encouraging sign, however, is that while revenue per mile increased in 1929, operating expenses per mile decreased, this being the first time such a tendency has been apparent since the post-war peak of 1920. The peak in revenue per car mile was reached in 1922 with 40·36 cents. Since then there has been a maximum falling off of 1·87 cents, but for 1929 the figure stands at 1·55 cents below 1922.

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Undoubtedly, says the report, the extension of omnibus services which have not yet developed full revenue in relation to miles operated, but which may not require so much to justify their operation, has accounted for this decrease in the revenue per car mile. The number of car miles operated increased nearly 19 per cent in this period, whereas the revenue increased only 14 per cent. Revenue per car mile increased 125 per cent from 1901 to 1928, and operating expenses per car mile increased 177 per cent in the same time. It is interesting to note a decline of over 10 per cent in operating expenses since 1921, the use of one-man cars having been an important factor in that movement.

A chart shows the distribution of the gross revenue of the entire industry from 1909 to 1928. In 1909 operating expenses absorbed 56·24 per cent, in 1911 it was 54·88 per cent, and in 1921 the peak was reached with 74·59 per cent. Since then the ratio has been more favourable, being 63·41 per cent in 1928. Deductions from income have steadily grown; in 1909 this was 9·61 per cent of the gross revenue, and in 1929 it had risen to 28·56 per cent, due to financing by the issue of bonds instead of stock, bond interest being a deduction from income, whereas, of course, dividends on stock are a payment from net income. In 1921, 19·5 per cent of the total revenue was available to pay investors; in 1928, 33·33 per cent was available for capital reserves and to pay investors, as against 32·96 per cent in 1927.

### Fares, Wages and Cost of Living.

An interesting chart on fares and wages and the cost of living indicates the difficulties under which the electric railways have been operating. In 1918, with fares the same as in 1913, wages increased 42·9 per cent. From 1918, both fares and wages advanced, wages reaching their peak in 1920 at 94·2 per cent above the 1913 level, but fares had increased only 22·5 per cent and did not reach their peak until 1925, when they were but 46·76 per cent over 1913. There have been a few changes in city fares from 1925 to 1929. The cost of living in 1921 was 53·3 per cent above 1913 and has remained about that level since. Up to the end of 1929 the increase in fares was still considerably behind the increase in wages. Fares were 51 per cent higher than in 1913, whereas the cost of living was 57·7 per cent higher. Wages were 98·6 per cent above 1913, or nearly 3 per cent greater than in 1928. Wages, therefore, show an increase about twice that of fares and living costs.

### Omnibuses and Coaches.

The electric railways make extensive use of the motor omnibus and coach, the number having grown from 13 omnibuses in operation in 1921 to 540 omnibuses and coaches in 1929, development having been particularly rapid in the past four years. The use of omnibuses for feeder services has increased considerably during the past three years, more than half the services owned by the electric railways being used for this purpose. There has been a distinct trend towards the absorption of independent omnibus lines, many of which, on suburban and inter-urban services, have been carrying passengers to the centres of the cities and depriving the street railways of passengers and revenue. During the past two years the larger and more important competitive omnibus lines have been purchased, and the report makes the point that the electric railways, with their facilities and organisation, are the legitimate transportation to control the operation of coaches and omnibuses. No trolleybuses are operated in Canada.

### Efficiency in Mass Transportation.

A number of charts devoted to the comparative efficiency of passenger vehicles in mass transportation, show in favour of the street car. On normal weekdays last February during the evening rush hour (5 to 6 o'clock) a count was made of all traffic leaving the centre of a typical Canadian city. The results showed that street cars comprised only 8·1 per cent of the passenger vehicles movement, but they carried 78·8 per cent of all passengers and occupied 24·1 per cent of the street space taken up by all passenger vehicles. Omnibuses comprised only 0·7 per cent of passenger vehicles, carried 1·3 per cent of the passengers, and occupied 1·40 per cent of the street space. Automobiles comprised 91·2 per cent of the vehicles, carried only 19·9 per cent of the passengers, and occupied 74·5 per cent of the street space. This, says

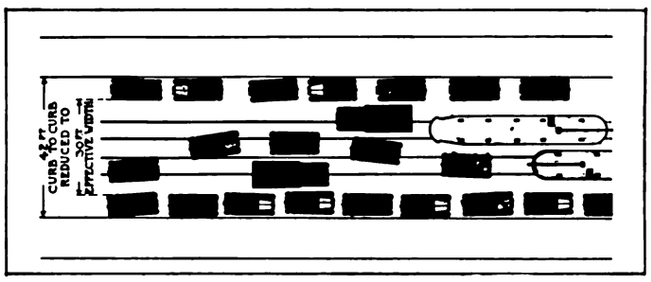


Fig. 1.—Parked motor cars narrow the street by 30 per cent and decrease its traffic capacity 50 per cent.

the report, shows that the street car is by far the most efficient vehicle in handling mass transportation on the streets of a modern city. Carrying this comparison further, one of the charts shows the comparative street area used per passenger carried: 466 street cars and 200 trailers occupied 510 sq. ft. each and carried 57,265 passengers, an average of 5·9 sq. ft. per passenger; 55 omnibuses took up 330 sq. ft. each and carried 971 passengers, an average of 18·7 sq. ft. per passenger; 7,486 motor cars occupied 140 sq. ft. each and carried 14,422 passengers, or 72·5 sq. ft. per passenger. The street car is thus more economical of street space than other road passenger vehicles.

Parking in the streets is also the subject of two interesting diagrams. Fig. 1 shows a line of parked motor cars on each side of a street, narrowing it by about 30 per cent and decreasing its traffic capacity by fully 50 per cent by eliminating two of the four traffic lanes. It decreases the speed and hence the traffic capacity still further by forcing all traffic into one lane, the speed of which is limited by the slowest vehicle. An impatient driver trying to pass on the wrong side creates danger, and opposing traffic is delayed. Main arteries of travel should be reserved exclusively for moving traffic, not as storage places, is the comment of the report (Fig. 2).

A further diagram shows how street cars relieve traffic congestion. One street car carried as many passengers as 45 motor cars during the rush hour, so that there is no comparison between the street area occupied and the congestion created by 45 motor cars as against one street car (Fig. 3).

The report observes that when traffic regulations are under consideration, there is often a tendency to

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favour the greatest movement of vehicles without regard to the number of people affected. This acts to the detriment of the street-car rider. Fig. 4. shows

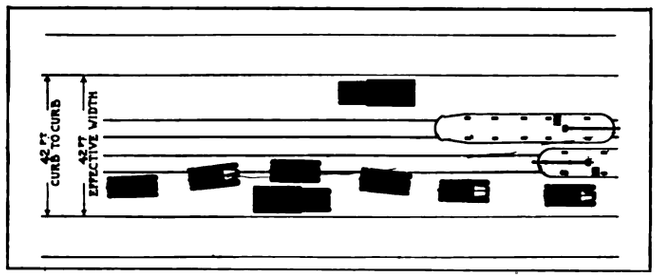


Fig. 2.—With no parking the whole street is available for traffic and fast and slow can be segregated.

that street cars comprise only 10·8 per cent of the total passenger vehicle movements, yet they carry 89·2 per cent of the passengers entering and leaving the central business district during an average day. On the other hand, motor cars comprise 89·2 per cent of the vehicle

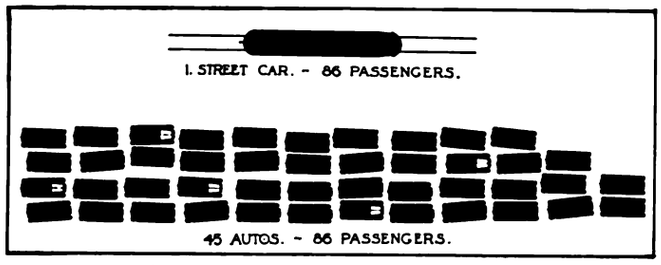


Fig. 3.—How tramcars relieve congestion. One tramcar carries the same number of passengers as 45 motor cars.

movements yet carry only 29·9 per cent of the passengers. To relieve the evening rush-hour traffic, it has been suggested that certain businesses might alter the hours of their employees so that the number at the very peak would be considerably diminished. In Canadian cities five o'clock is almost the universal closing hour. If 16,000 workers, or about 25 per cent

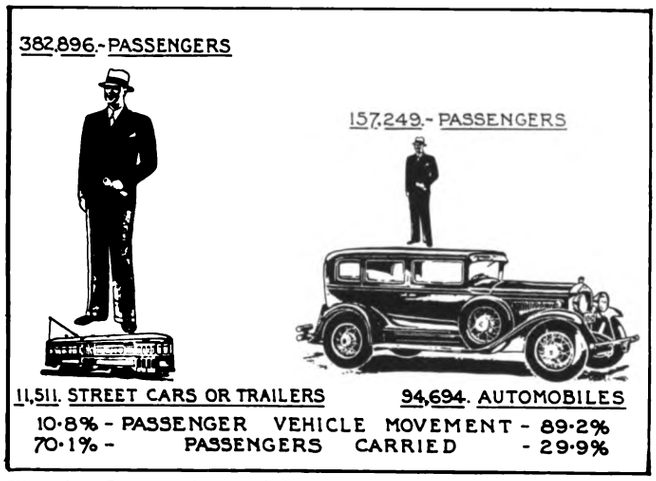


Fig. 4.—Comparison of tramcar and motor car traffic and the number of passengers carried by each, showing greatly in favour of the tramcar.

of those employed in the area, had their hours advanced thirty minutes, the evening traffic peak could be reduced nearly 40 per cent, effecting an almost ideal arrangement.

We reproduce one or two of these interesting diagrams, as they show vividly certain advantages of the tramcar in transporting crowds of people which are not generally realised.

## TROLLEYBUS CONTROLLER EQUIPMENT.

The increase in the number of electric trolleybuses now in operation has created a demand for a fool-proof reliable controller equipment capable of withstanding the heavy duty imposed on this class of vehicle. It may be of interest, therefore, to give particulars of the latest type of equipment made by the Electro-Mechanical Brake Co., Ltd., of West Bromwich, who have supplied a large number of controllers for use in this country and abroad during the past six years.

This equipment, which is adapted for the controlling and braking of two motors, consists of four main components: Traction Controller, Braking Controller, Contactor Panel, Traction and Braking Resistances.

The traction controller, which is usually placed underneath the driver's seat, is arranged to be operated by a foot-pedal, to give four series, three parallel and one field shunting notches. Provision is made to prevent

EMB Type TB 6 Traction Controller.

the main controller drum being moved more than one notch at a time without a pause. Nevertheless, with very little practice, the drum can be advanced to the last notch in five seconds for rapid acceleration, but however skilled a driver may become it is impossible for him to operate the controller sufficiently fast to damage the motors. A reversing drum is operated by a separate lever, which is so interlocked with the main drum that it cannot be moved unless the main drum is in the "off" position.

If either motor breaks down, provision is made on the reversing drum, which enables the faulty motor to be cut out easily and the load taken on the other one, the controller being operated in the usual manner for forward or reverse. In this case, however, an interlocking motion limits the movement of the drum to the series notches.

The method of operating the controller is as follows:—

On boarding the vehicle the driver puts the hand lever into either the forward or reverse positions, depending upon the direction required. He then

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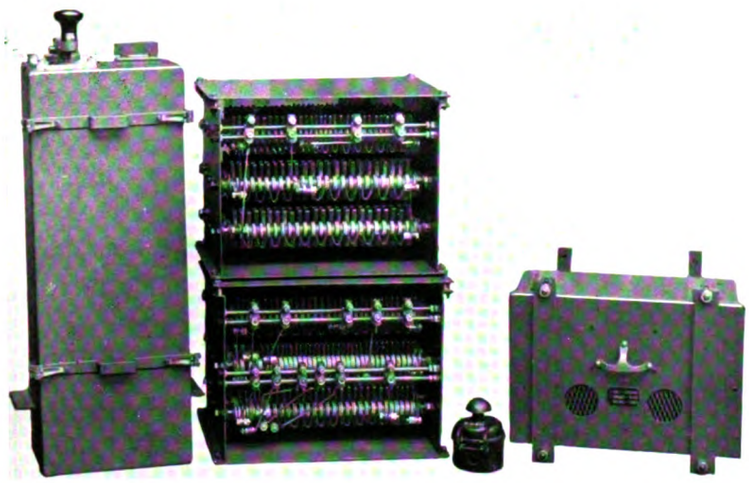
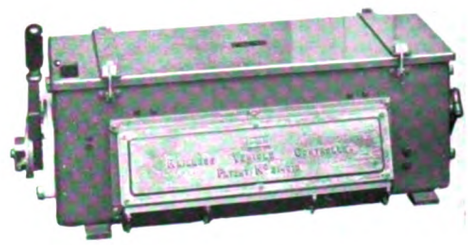
depresses the foot lever which moves the main drum to the first notch, and by a series of further depressions the main drum is moved to its "full on" position. To cut off the power to the motor, the driver simply eases his foot off the pedal, and the main controller drum, which is spring controlled, is returned automatically to the "off" position. Only a very small movement of the foot pedal is necessary to change from one speed to the next, and as the operating shafts are mounted on ball-bearings the control is exceptionally light. Little effort is needed to hold the controller at any particular speed, the weight of the driver's leg being quite sufficient.

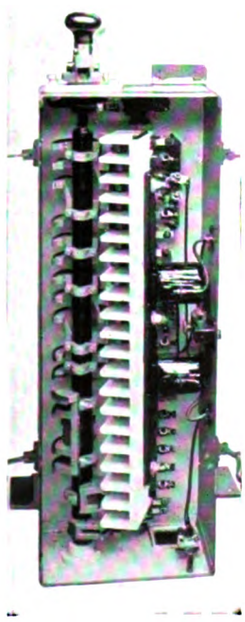




"EMB" Railless Vehicle Controller Equipment.

Blow-out coils, provided over each finger, are so arranged that the arc is blown away from the drum and the contact fingers on to a copper shield fitted at the back of the dividing shield between each finger. The whole blow-out unit, including coils, can be lifted out without removing any cables or other fittings.

Both mechanically and electrically the details are designed on generous lines. From the maintenance point of view, care has been taken to ensure easy and cheap renewals when these become necessary.

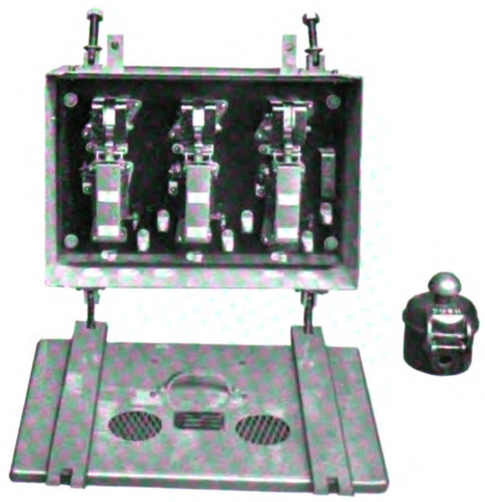


"EMB" Braking Controller.

The braking controller unit is similar in design to the well-known "EMB" steel case air break controllers. It is arranged with three braking notches, and is mounted beside the driver in a convenient position for operation by crank handle, or it may be connected by suitable gear to the foot brake or other pedal. Leads for connection to the resistances are passed through a lead bushed hole in the base of the controller This controller is suitably interlocked with the main controller electrically.

The provision of a contactor panel eliminates the necessity for breaking heavy line current on the traction controller, all make and break and changeover from series to parallel being accomplished by it. The panel, which carries three single-pole contactors, one for series and two for the parallel connections, is mounted in a steel case having a waterproof lid.

The contacts open and close with a quick positive action, and this, combined with the efficient blow-out coils fitted, reduces arcing to the minimum. The movement of the contacts is arranged to give adequate roll with sufficient rub to keep them clean.



Contactor Panel and Switch.

The traction and braking resistances are mounted independently as two separate units and are of the "EMB" unbreakable, jointless and rustless grid type, which are particularly suitable in cases where the equipment is likely to be subjected to excessive vibration. Each section is made in one continuous length of drawn material, which reduces the number of joints to a minimum. The consequent risk of open circuit or intermittent contact is therefore greatly reduced.

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THE
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The Editor will consider contributions offered for publication in THE TRAMWAY AND RAILWAY WORLD (including the Omnibus and Coach Section) by those conversant with the subjects that come within the scope of this journal. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, NOVEMBER 13, 1930.

**Business Management for London Traffic.**

It requires but a cursory examination of Mr. Morrison's proposals for London traffic co-ordination, so far as they are known at present, to find that their basis differs fundamentally from the old Labour Party conception of direct State or Municipal management on departmental lines. Instead of this there is to be a business board of management composed of men chosen for their ability and knowledge of transport operation and conditions and free from political interference. Mr. Morrison spoke on these changed opinions at a dinner of the London Underground and Omnibus Joint Committee of the Railway Clerks' Association. He said there had been far less surprise in Labour and Socialist circles than in other quarters at this breaking away from the Party platform, but added that the critics of Labour policy had always exaggerated the alleged bureaucratic aspect of Socialist thought, and naturally were not altogether familiar with its up-to-date thought. Nevertheless, here is evidence of new ideas and a revision of old ones—recognition of the futility of trying to control great business enterprises by inexperienced civil servants or municipal officers. Even if his Party should jib at this throwing over of a long-cherished idea, they should be consoled by the fact that neither would London tolerate a huge private monopoly which would place the people at its mercy in the matter of passenger transport. Mr. Morrison has wisely chosen a middle course, which on the whole has been received favourably. He has put forward what is in effect the fashionable cure of rationalisation, the grouping of several undertakings to prevent waste and overlapping of services, under efficient management. Everything will depend on the choice of men for the board, a fact of which Mr. Morrison, with his keenness for efficiency in the public service, is fully conscious. In the meantime it is gratifying to note the growth in Labour thought, and Mr. Morrison's belief that nearly all big trading undertakings—by which it may be presumed he means public undertakings—should be managed by those who have experience and knowledge of them, and not by civil service or municipal departments. To this extent it may be claimed that good has resulted from the Government's rejection last year of the Bill of the London Underground Group and the County Council for the unification of London traffic. The interval has strengthened the Minister of Transport and the Government in the conclusion that bureaucratic rule and an endless drawing upon public money are poor substitutes for enterprise and efficiency. The Party, too, are now committed to that view. The Minister may claim that his attitude has been consistent all through. In the remarks which he made in declining to provide further facilities for the Bill he said that the Government "desire to make it clear that their aim will be to effectively provide for the principle of commercial management of a self-supporting consolidated transport system, thus ensuring the advantages of vigorous business enterprise."

**Drivers and Conductors as Salesmen.**

Almost daily we are reminded that this is the age of salesmanship. Everyone has something to sell, be it goods, service, or that elusive quality now termed personality. Drivers and conductors of road passenger vehicles are also being reminded that they come within the category of salesmen by municipal committees and operating companies who, facing intense competition, feel that they cannot afford to miss a single passenger. In an open letter to omnibus workers, reprinted

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in part in our issue of June 19, Mr. George J. Shave, operating manager and chief engineer of the London General Omnibus Company, says: "It is essential that we carry as many passengers as we can; never pass a prospective fare. I cannot too strongly emphasise the importance of conductors looking round before ringing off, so as to avoid losing intending passengers." Councillor Cooper, of Middlesbrough, says bluntly that drivers and conductors are salesmen "just as other people are," and that if they were to exercise greater vigilance the number of passengers would be greatly increased. Hardly anyone will deny that these reminders are necessary, not because drivers or conductors wilfully ignore intending passengers, but so many of them do not appreciate the fact that they are the purveyors of a service in which the art of looking for additional customers is increasingly essential, and they have had no training in this direction. Too often passengers are left standing on the kerb while the vehicle sails past, signals are unnoticed, and it is not uncommon to see people left panting on the pavement after a vain dash to board the vehicle. Treatment of this kind leaves feelings of resentment, and no business of this nature can afford to carry such a weakness indefinitely without feeling the harmful effect of the loss of goodwill, one of the most valuable assets of any modern enterprise. It may be trite, but it needs saying again, that a service offered should be performed in such a way as to please and attract the travelling public so that they can rely on it under all conditions. Drivers and conductors, of course, have other duties to perform, but undoubtedly they can do more in the finding of passengers. Some have the natural personality of the salesman; all would benefit by a short course of training in the art, with advantage also to the proprietors of the undertakings which they represent. It seems that the day is approaching when an understanding of salesmanship, as applied to the selling of a road passenger service, will be one of the qualifications for the position of conductor, at any rate, and operators will doubtless include the subject in their training courses, in view of its increasing importance.

**Manchester's Tube Problem.**

In pre-war years Manchester Tramways Committee devoted considerable attention to the question of providing the city with underground electric railways. The object, of course, was to lessen congestion of surface traffic, and the late Mr. J. M. McElroy, general manager of the tramways, compiled various reports that still should be of value. That nothing came of the deliberations was due to the great cost—a far more formidable consideration now—and to the war. Prompted no doubt by the far heavier traffic of the present day, which seems to produce greater congestion although through omnibuses now traverse the city in all directions, the tube proposals have been revived on two occasions since the war, though not by the Tramways Committee. Attention is at present being directed to the problem by a wider circle of investigators than in the past. It is all to the good that the railway authorities are joined in the discussion; for no proposal for an underground line can afford to ignore the effects thereon that would arise if and when further electrification of the surface railways is effected. From eight to twenty million pounds has been mentioned as the probable cost of tubes, and it has been urged that the outlay would be worth while if it did away with "the terrible rush hour congestions which daily harass the Manchester worker." On the other hand a cautious commentator says that as the business districts are concentrated within a radius of half a mile, it is arguable that while a tube would greatly expedite traffic from Victoria to Central Stations, it would be no saving for people whose business is in Cross Street. This situation would be repeated in plenty of other city districts. Therefore, say the opponents of the tube, people would continue to use omnibuses and tramcars, and so congestion would not be materially reduced. To that fact we would add that people are loath to go underground for distances up to a mile. A point that does not seem to have been considered, so far as is revealed by published reports, is whether the tube shall be given a reasonable chance of achieving financial success. A vast outlay that is going to serve Manchester and its environs merely by radial lines and a circular linking up is not to be

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desired. The lines must go far afield, come to the surface and be operated as part of existing tramways or railways.

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**New Developments In Regenerative Control.**

In view of recent developments in other forms of transport, every effort to reduce the working costs of electric tramways must awaken the liveliest interest. For this reason we commend to the attention of readers the paper by M. Bacqueyrisse, the well-known director-general of the great Paris Transport undertaking, on regenerative control which appears elsewhere in this issue. The author sets out in detail the arrangements effected in a large number of cars and claims that power expenses have been reduced thereby from 25 to 30 per cent. Moreover, he claims that with regenerative braking smoother operation of the cars is secured with consequent reduction in the cost of maintenance. The Paris company appears, indeed, to have realised all the advantages sought by the late Mr. John Raworth in the experiments that he initiated in this country some twenty-five years ago when electric traction motors were much less adapted to regenerative control than they are to-day. While the system as applied in Paris is not yet finally beyond the experimental stage, the results now being obtained are such as to justify the hopes of the designers; and their willingness to give to their colleagues everywhere the fullest information and to allow detailed inspection of the apparatus indicates that they have no doubt of complete eventual success. The recent meeting in Paris has placed engineers from various countries in possession of the ideas on which the Paris company have been working, and an impetus has been given to further experiments which will, we believe, prove of much value. Many thousands of new car equipments have been purchased within the last few years, but much remains to be done to bring electric cars in this country up-to-date, so that ample opportunity remains for the adoption of designs similar to those applied in Paris. It is essential that power costs should be reduced to the lowest possible figure. No undertaking can afford to overlook the possibilities offered by regenerative control. Competitors neglect no opportunity that new discoveries provide of more economical working. Without similar enterprise engineers and manufacturers in the electric field cannot hope to support, much less to extend, their industry.

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**Rights on Tramway Tracks.**

In giving a decision at Bow Street on March 30, as a result of a collision on the Embankment between a tramcar and a motor-coach, Sir Chartres Biron, the Magistrate, stated that tramcars were public vehicles and had the right of way on the tramway tracks. What Sir Chartres no doubt meant, and, indeed said, was that drivers of other vehicles using the track must use proper care and precaution. He quite properly dismissed the summons against the motorman for failing to bring his tramcar to a standstill to avoid pending danger. On the merits of the case the decision seems correct, and in the interests of public policy it is a wise one. On the other hand tramcars cannot claim any exclusive right of way of the tramway track, their only right being that of other vehicles to use the roads. No objection has ever been raised to other vehicles going on the tramlines. They are and must be so used every day, for it is obvious that to attempt to stop them would bring traffic practically to a standstill, and lead to chaos. Conditions on the Embankment are, however, exceptional. Two traffic streams run east and west for vehicles other than tramcars, the two sets of tramway lines being side by side on the south side of the road. It is an extremely busy route; the traffic is unusually speedy, and at no time of the day is there room or time for a motor-coach to turn round without holding up the traffic and running a real risk of collision, so that the rare driver who is in an extraordinary hurry and ventures on the track is inviting trouble. In the case mentioned the driver of the motor-coach was turning at the time of the collision, and it is possible that he was unacquainted with conditions on this route. The safest method, and the quickest in the end, when a driver wishes to turn his vehicle, is to keep in the line of traffic and turn off at one of the numerous openings facing north and make a detour. In short, every vehicle has the right of the tramway track, but the driver who uses it on the Embankment is extremely foolish.

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# REGENERATIVE CONTROL WITH COMPOUND MOTORS ON PARIS TRAMWAYS.

A Paper by M. BACQUEYRISSE

Director-General of Operation and Technical Services, Société des Transports en Commun de la Région Parisienne.

**Presented at a Meeting of the INTERNATIONAL TRAMWAYS AND LIGHT RAILWAYS UNION at Paris, October 21, 1930.**

At the outset I propose to explain the principles on which our equipments have been designed and to emphasize several characteristic features which have specially attracted the attention of many eminent technical visitors who have recently come to inspect our equipment in operation. In the second place I wish to describe the simplifications and improvements we have effected.

Our equipment includes compound motors of somewhat special construction securing a very wide variation of speed by the control only of the field windings of the two motors which are arranged permanently in series. Figure 1 illustrates diagrammatically this arrangement in the case of a two-motor equipment.

The armature, series and interpole field coils are arranged in series under full line voltage, resistances being inserted at the commencement of starting. The shunt field windings are also arranged in series under full line voltage with an exciting rheostat in their circuit. Starting is preformed with maximum shunt current—i.e., by short circuiting the shunt field rheostat and then by cutting out successively the two series resistances. An increase of speed is then obtained by reducing progressively the shunt current by means of the rheostat. Reverse operation—i.e., the progressive increase of shunt current—gives to the armatures an electro-motive force greater than the line voltage and consequently returns to the line a current varying according to the current in the shunt. The return of current to the line is accompanied by a reduction of the kinetic energy of the vehicle, in other words of the running speed.

### Permanent Coupling of Motors.

### Abolition of Series-Parallel Transition.

Permanent coupling of the various circuits—i.e. their feeding under constant voltage, is the first essential of our equipment, as it avoids numerous and important disadvantages which result from a series-parallel transition with compound motors. This series-parallel transition, easy to effect in series motors either by short-circuiting the motor or by the bridge method, is in fact very difficult in the case of compound motors, as the short circuiting of a single motor (as would be the case with the former method), or of the two motors (as would be the case with the bridge method) operates these motors as generators and consequently exerts a braking effort. The insertion of resistances in the various circuits to limit the output of current and consequently the braking effort is a partial remedy, whose efficacy depends on the size of these resistances, and involves corresponding rheostatic losses. In other words, we must permit heavy losses of energy in order to reduce the peak without eliminating it completely. This solution was tried by English engineers, especially Mr. Raworth, who took out twelve patents from 1903 to 1907, after studying for a long time the working in series of shunt motors temporarily used as compound, at a time when, it must be admitted, the absence of commutating poles narrowly limited the possibilities.

They concluded they must search for a solution in the complete opening of the traction circuits between the series and the parallel positions. This solution, though producing a discontinuity in the tractive effort at starting and in the resisting effort at braking, is of course to be preferred to those which invert momentarily the direction of these forces. Besides, all such solutions involve another inconvenience which arises from the difficulty caused by the high self-induction of the shunt coils in making a rapid change from the minimum value of the shunt current for the series position to its maximum value for the parallel position or *vice-versa*.

We are thus compelled after all to limit the peaks of intensity and tractive or braking efforts by inserting resistances, i.e., rheostatic losses. But whatever the system adopted the peaks and discontinuity in tractive or braking effort lead to a waste of energy which is one of the reasons for the high consumption observed with these equipments.

A thorough study of the question enables us to say that the size of these resistances should not be the same for series-parallel transition as for the parallel-series transition; and we are thus faced with another complication in the equipment which results in an increase in its weight, in the weight of the wiring, in electrical losses in this wiring and eventually in the number of failures.

There is finally the question of instructing the personnel. Where series-parallel transition is to be provided for considerable difficulty arises, to say nothing of the problem of ensuring competent operation of the controller under service conditions. The only practical remedy for all these disadvantages is the abolition of the series-parallel transition and you will observe on our cars we have now obtained perfect continuity in tractive and braking effort which assures the comfort of passengers and reduces the expense of maintenance. At the same time economy in current consumption naturally follows the smoother application of power. Extreme simplicity of equipment even when compared with normal series motor equipment is also characteristic. Figures 2 and 3 illustrate our equipments with two series motors, and with two compound motors, the latter our design of June last. I will show you later the simplification and improvement which we have introduced since that date. I will recall rapidly some of the results which are attributable to this abolition of the series-parallel transition :—

(1) Reduction in the length of traction cable on the car from 333 metres to 136 metres.

(2) Reduction of total weight of motor-car by 300 kilogrammes.

The abolition of series parallel transition or what amounts to the same thing, working of the motors under constant voltage, necessitates a very large range of speed of the motors which is controlled in the only possible way, by variation of the series field.

Reverting to my paper at Warsaw for the detail of the modifications applied to our motors of types TH523 and TH563 and for the results obtained from them on bench tests, I would remind you that the extreme speeds are in the ratio of 5 to 1, corresponding with the gear ratios used to car speeds of 6—30 or 8—40 kilometres per hour. In order to obtain such a high ratio merely by field alteration the motors have to work between wide limits of saturation. Complete saturation of magnetic circuits at the beginning of starting reduces the lowest speed without running resistance either to 6 or to 8 kilometres per hour and limits to two the running notches which include resistances and therefore involve low efficiency. In the case of a single car without trailer this number may be further reduced to one.

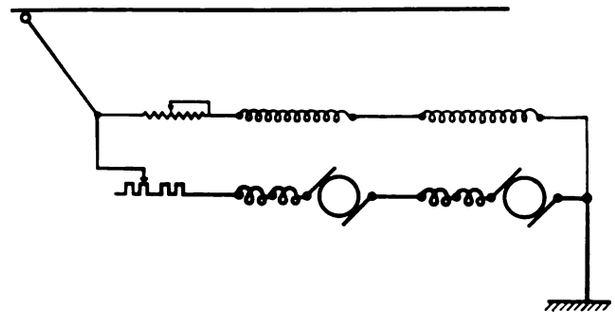

Fig. 1.—Diagram of Arrangement for Regeneration with two Compound Motors.

On the other hand, the use of high maximum speeds has enabled us to secure the advantages which result from satisfactory commutation when running at low magnetic saturation. These advantages are :

(1) High value of the ratio $\frac{\text{Field ampere turns.}}{\text{Armature ampere turns.}}$

(2) Large air gap.

(3) Pole pieces of suitable shape.

(4) Commutating poles.

(5) A large number of commutator segments to give small potential difference between segments or, what amounts to the same thing, the lowest possible voltage at the terminals of the armature.

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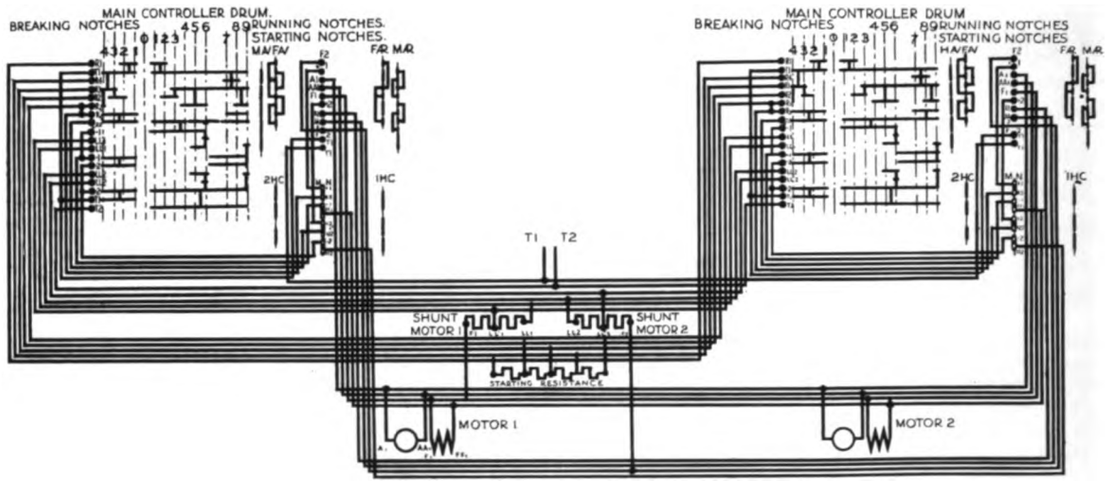


Fig. 2.—Diagram of Equipment with two Series Motors, Type L.

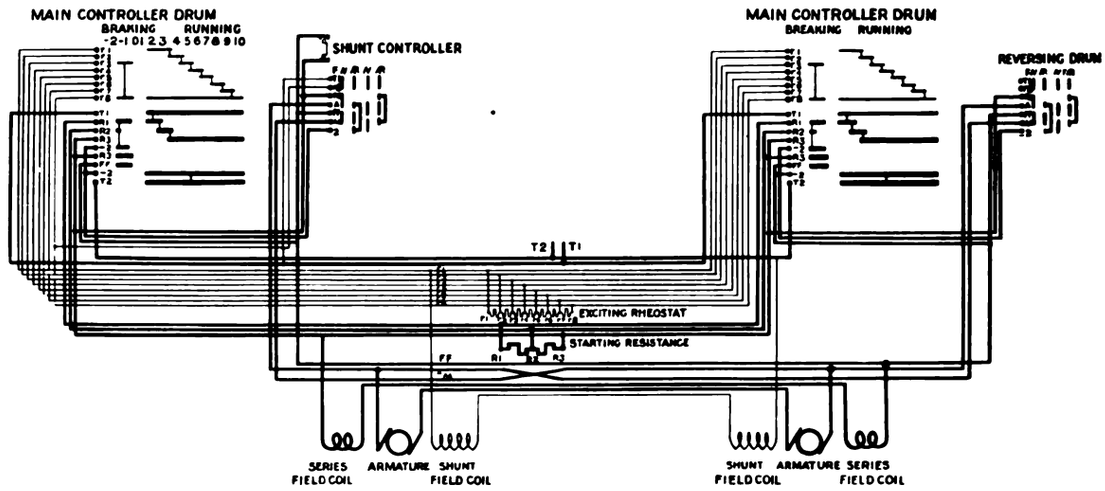


Fig. 3.—Diagram of Equipment with two Compound Motors, Types L and G.

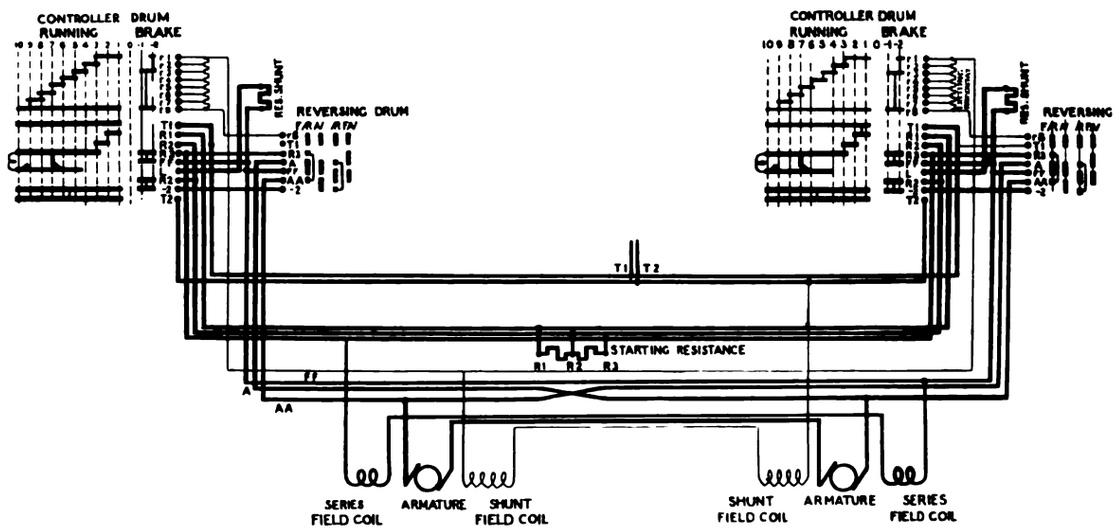


Fig 4.—Diagram of Equipment with two Compound Motors arranged for Series Shunting by Sliding Contact.

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The experiments carried out by my colleague, M. Castaing, on potential differences between commutator segments in relation to desaturated running have been of the greatest help. A summary of these experiments was published at our National Technical Meeting in Algiers in January, 1930, and they have since been extended to include compound motors.

ARRANGEMENT OF MOTORS IN SERIES.

The condition of low potential at armature terminals is easily satisfied when all the motors working on a single car can be grouped in series, and this is the second essential feature of our equipment—permanent arrangement of the motors in series. At first sight this does not appear to be of great importance; and at one time, nearly seven years ago, we tried coupling motors in parallel. We found, however, that it was almost impossible to obtain a proper distribution of energy between motors when these were provided with commutating poles and were required to run at low saturation. You are aware that with commutating pole motors any angular displacement of brushes behind the theoretical neutral line produces an electro-motive force in the armature. This in its turn causes a flux in opposition to the main flux and as it increases with the current taken by the armature it becomes a serious drawback when the main flux is very low. With every increase in current demand by the motor there is a corresponding diminution in the main flux and running away of the motor. The running away is only limited by the saturation of the commutating poles. This tends to slow it up and then the cycle begins over again. This is the phenomenon commonly known as "pumping." It is so difficult to establish the right brush position in the case of high tension desaturated motors that serious variations in the speed are almost inevitable for equal and opposite flux. This disadvantage, awkward in the case of a single motor, is made much worse by circulating currents, in the case of parallel grouping of two desaturated motors, even where inaccuracies of construction are extremely small. We therefore adopted the arrangement in series which gives us many advantages over that in parallel without any disadvantage. I will mention the following:

(1) The absolute certainty of an equal application of power to the different axles.

(2) A reduction in the value of the self-induction of shunt coils and an improvement of the conditions under which variations in the shunt current are made.

(3) Simpler construction and lower cost of motors working at a lower voltage.

I wish to emphasise this latter point as it has occasionally been misunderstood. I have in fact been told that a motor of 300 volts of the same power as one of 600 volts having to take double current must have conductors of double section and therefore be much heavier. This is not the case as is shown in a second appendix to my paper. If the sections of the copper conductors have to be doubled for equal flux and speed rotation, the number of these conductors has to be halved. Accordingly the total weight of conductors remains unchanged. Actually the weight of the 300-volt motor works out slightly less than that of the 600-volt motor whatever the method of winding may be; for the volume and insulating material between the conductors has been reduced at the same time as the number of conductors and an over-all reduction of size becomes possible. Finally, the size of the commutating poles can, other things being equal, be reduced in proportion to the fall in voltage. I estimate that if we keep the same insulation in relation to weight and voltage, and the same approximate horse-power (50), the diminution in weight of the motor TH563 for 300 volts, over the same motor for 600 volts, whose weight is 720 kgs., amounts to 50 kgs., or 7 per cent. In any case, I wish to make clear that the weight of a motor will never be increased by lowering the feeding voltage. This applies, of course, to motors running at similar speeds for the same power as can always be provided for when building new vehicles. I shall come back later to the question of the transformation or adaptation of existing motors, which is a little more complicated.

To sum up. The two essential features of our equipment are—

(1) Motors fed under constant pressure;

(2) Arrangement of these motors in series whether they are odd or even in number.

The first allows the suppression of series-parallel transition and the elimination of rheostatic losses corresponding to this transition, and also an important simplification in the methods of speed control, in wiring and equipment in general. It also leads to even starting and braking, a reduction in upkeep charges, increased comfort for the passengers, and a reduction in energy consumption. In addition the working of the controller is much simplified; it becomes very much like the accelerator pedal of a motor-car and requires only a short training for the driver. It results in easier driving and calls for less skill.

The second feature allows an equal distribution of driving or braking effort between the different axles, eliminates circulating currents with a corresponding reduction in energy consumption. It makes possible the use of any number of motors, odd or even, so that a damaged motor can be cut out leaving all the others in circuit and not half only as in series-parallel transition equipment. It allows for a simpler construction of motors as they are working at only a fraction of the total voltage. These two features taken together enable a considerable reduction to be made in the weight of the vehicle and its first cost.

USE OF VITRIFIED RESISTANCES AND OF TWO RESISTANCE SETS FOR SHUNT EXCITATION.

First of all, our shunt field resistances, which were originally made of German silver wire stretched on an insulating frame, have been replaced by high resistance wire contained in vitrified porcelain tubes. These tubes are very strong, they take up less space and can be maintained at a temperature of 200 deg. C. For the present, however, we do not let them heat above 80 degrees as we prefer absolute safety to a slight saving in space. The size and weight of these resistances are, however, so very much reduced as to make it worth our while to use two groups of resistances on a car instead of a single one and to place them close to, or, better still, inside the controllers as I will shortly show you. By this arrangement, shown in Fig. 4, we have been able to reduce the number of shunt field cables connecting the two controllers from eight to one, leaving us with 50 ft. instead of 450 ft. for the total length of these cables. The saving in weight is not very important as this is comparatively light wire, but the cost is appreciable and the number of breakages, which is of much greater consequence, will clearly be reduced.

EQUIPMENT ARRANGED FOR SHUNTING THE SERIES FIELD.

The realisation of a high torque at the beginning of starting, followed by regular acceleration, requires in the case of series field regulated compound motors a high value of the shunt field, which can

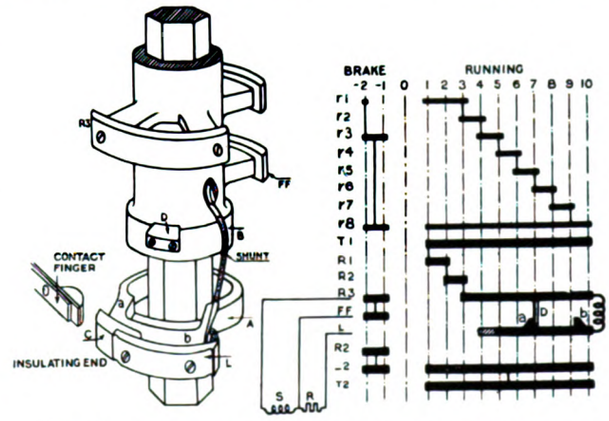


Fig. 5.—Device for Shunting Series Field by use of Sliding Contact.

only be attained by the use of a large number of series turns. In order to attain a wide range of speed a large number of series turns is needed to reduce the minimum speed, but a low series current is necessary towards the end of starting, because the reduction of the shunt field leads, for a given resistance on the shaft of the motor, to a reduction in the armature and series coil current. Consequently, if the number of series turns is not small one would replace by series field ampere turns the greater part of the shunt field ampere turns which had been reduced with the object of increasing speed. The latter, of course, is nearly constant towards the end of starting. In the same way, when regenerating, since the series field exerts a differential action in relation to the shunt field, it is necessary in order to obtain the highest value of regeneration to have as small a number of series turns as possible compatible with the necessity of assuring stable working as a generator.

The dispositions I have adopted in our most recent equipment of compound motors aim at securing at the same time the four advantages of:—

(1) High starting torque and acceleration at commencement of starting.

(2) Low minimum speed.

(3) High maximum speed.

(4) High proportion of regeneration.

These have been attained by the use of a larger number of series turns than in the equipment described at the Warsaw Congress, by shunting these turns beyond a given notch upon the controller and by maintaining this shunting during deceleration, right down to, or very near to, a standstill.

The method of shunting by sliding contact, which enables us to attain these four advantages, is exceedingly simple, as will be seen in Fig. 5. When the controller handle is turned in the starting direction the series current attains its highest values on notches 1 to 5. For notches 5 to 10 the series current is shunted through the

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resistance $R$. During the opposite manœuvre the series current remains shunted until notch 3, which is the last notch for regeneration, notches 1 and 2 being only temporary and involving running on resistance. They are really only required for starting. A circular segment $L$ carried on a bush $A$ turns with sliding friction on a cylindrical seat $B$ of the drum spindle and is permanently connected by a flexible cable with the segment $R3$, which corresponds, as indicated on the controller diagram, to one end of the series field coil $S$. The segment $L$ carries at one end a sector $C$ of insulating material. Owing to the friction of the control contact

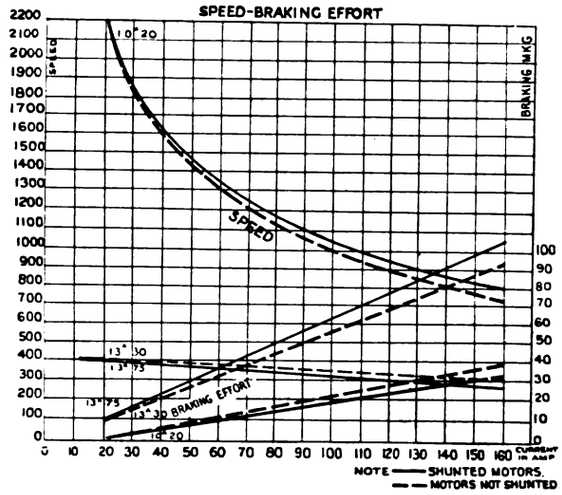


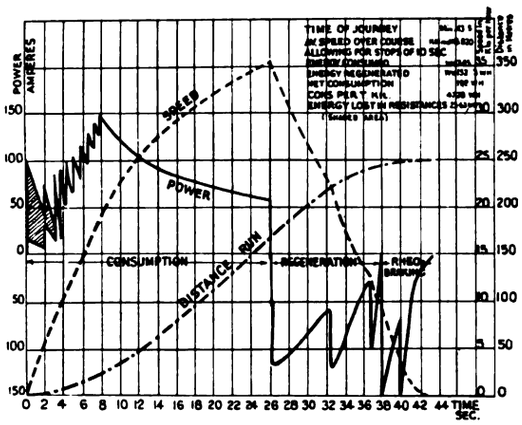

**Fig. 6.—Comparison of Characteristics of Compound Motor TH 563 without Shunt and with 50% Shunt of Series Field.**

finger on the insulating sector $C$, the segment $L$ remains stationary while the drum turns in the direction of increasing speed until notch 5 is reached. From this notch the stop $D$, coming into contact with the end "$a$" of the hole made in the bush $A$, carries this bush with it, thus connecting the free terminal of the shunting resistance to the terminal $R3$ of the series field coil. The series field is thus shunted for all positions from 5 to 10 of the controller drum. When the drum is moved in the opposition direction the segment $L$ is held motionless by the friction of the contact finger until the stop $D$ makes contact with the end "$b$" of the hole in the bush. The series field remains shunted till notch 3 has been reached. In the latest type of our motor TH563 we have profited by the increase in the number of series turns—which amounts to 80 per cent.—to increase slightly the number of shunt turns so as to reduce still further the saturation of the motor at full field and to reduce the minimum speed of running without resistance. Fig. 6 gives the characteristics of our motor TH563 for the maximum and minimum values of shunt field and also for 50 per cent. shunting of the series field. The broken lines show the corresponding characteristics of the earlier motor. It will be seen that for a current of 20 amperes, which is the approximate current absorbed on a level road by our motors under balancing speed, the ratio of maximum speed to minimum speed is 5·17 as against 4·97 with the first type. It will also be seen that for a current of 100 amperes the effective torque is increased by 12 per cent., and this allows for an equal torque at starting, an appreciable diminution of current and consequently a reduction in ohmic losses on the first 2 notches. The increased number of turns in the series coils has not led to any increase in size of the coils because they remain shunted during most of the running time, and, therefore, a much higher current density is permissible for short periods. The volume of copper thus remains the same.

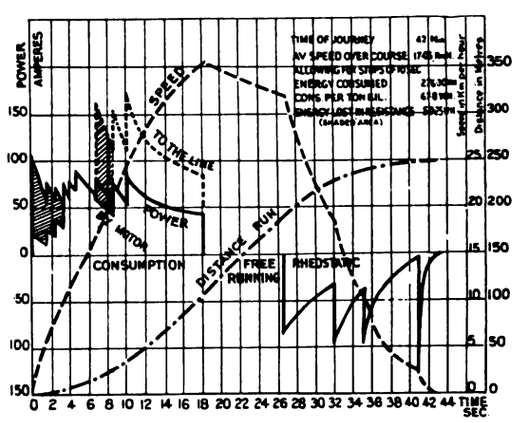
As a result of the tests we have carried out we can say that the current consumption has been reduced by over 5 per cent.; an ample justification for the adoption of so simple an arrangement. The maximum running speed has been slightly increased but this does not make very much difference to the service speed. It seems, however, that we have not taken full advantage of the system, and that by adopting two or more shunt notches, by the use of two or more sliding contacts, which could be quite simply done, we would obtain still better results.

There are also other advantages. In the first place, by the mere alteration in the amount of shunting it is possible to adapt the characteristics of the motors to the operating conditions of each line with respect to gradients. Another advantage which perhaps is special to the Paris tramways, because it is a requirement of its Inspection Department, consists in the much greater efficiency of rheostatic braking by short circuiting the motors under a shunt field, particularly when a damaged motor has been taken out of circuit.

At Warsaw I gave working diagrams (Fig. 7) of our equipments with compound and series motors for the same distance between stopping points of 250 metres. Fig. 8 gives the same particulars for our equipment with sliding contacts. As before, they are drawn up from data of our compound and series motors accurately measured during bench tests under similar conditions of acceleration at starting of 0·6 metres per second per second, and the same deceleration at braking of 0·8 metres per second per second, for a motor-car weighing 16 tons. These values of acceleration and deceleration have been selected at random. In reality, as you will observe when we make our trials in the cars, it is possible to attain much higher values with both equipments. In Fig. 8, three variables are shown against time; (1) energy absorbed or regenerated or employed in rheostatic braking; (2) speed of car; (3) distance covered. For these graphs we have assumed the same weights of car and have consequently allowed for the reduction of 300 kgs. in weight of the car with compound motors. The shaded areas represent energy lost in resistances. I cannot refrain from giving you at the same time the corresponding working particulars for the series type motors TH563 used without shunting—such as are still in service on a large number of systems—because I believe I was the first to advocate the regulation of speed of series motors by field shunting. For the acceleration to 36 km. per hour of a fully loaded motor-car the energy lost in starting resistances as percentages of the total energy consumed are respectively 6·04 per cent. for compound motors with sliding contact; 17·72 per cent. for series motor equipment with field shunting; 21·23 per cent. for series motor equipment without shunting. The net energy used by each equipment reduced to watt hours per ton kilometre are respectively:— 44.46 w.h. for compound motor equipment, 69·6 w.h. for series motor equipment, and 73 w.h. for series motor equipment without shunting. The nett




**Compound Motors under Load.**




**Series Motors under Load.**

**Fig. 7.—Working Diagrams for L-type Motor Cars.**
**Distance between Stops, 250 metres; Maximum Speed, 35.5 Km. per hour.**

saving effected with our equipment of compound motors in series comes out at 36·1 per cent. over the equipment with series motors with shunting and 39·1 per cent. over the equipment with series motors without shunting. In comparison with the compound motor equipment without sliding contact (Fig. 7), the saving of current amounts to 6·1 per cent. and service speed has been improved.

It is clear that this consumption represents the theoretical minimum which can be obtained with our compound motors and that

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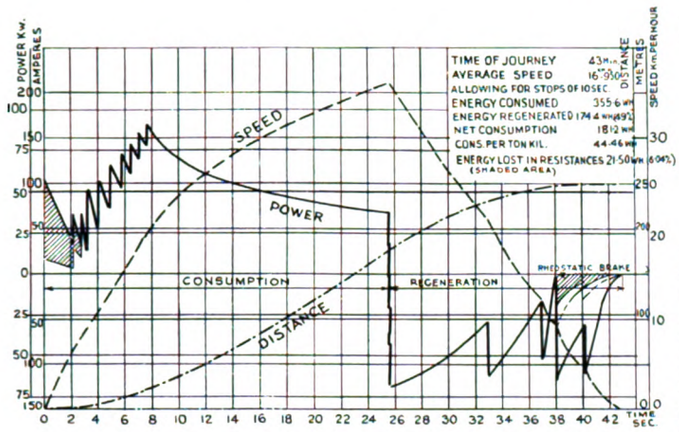
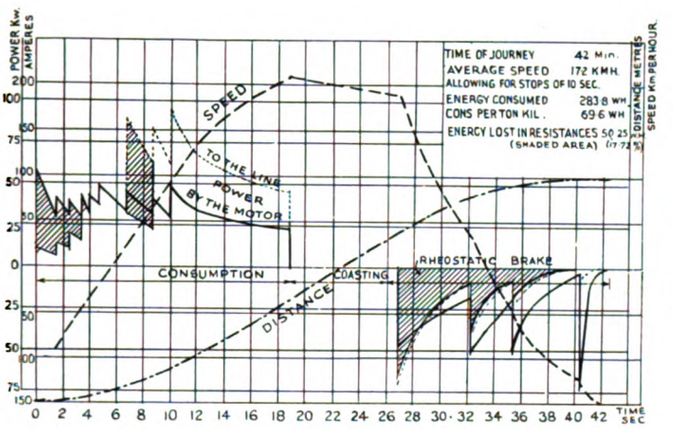
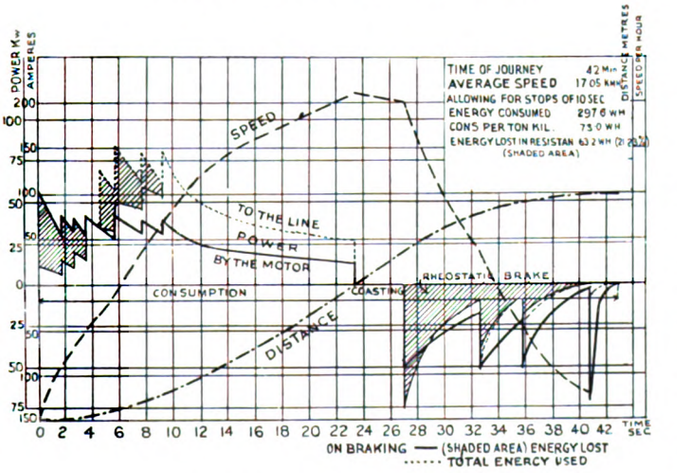
the percentage savings are calculated for a maximum speed of 36 kms. per hour which allows for very high regeneration. In practice, regulations forbid us to exceed 30 kms. per hour, and for this reason the values of regeneration and the percentages of savings will not be quite so high. In this connection I would recall the results obtained in normal working with passengers, which I gave you at Warsaw, and which have been fully confirmed by subsequent experience. Upon our line No. 1 (Louvre-Versailles) with moderate




Compound Motor L A with 50% Series Shunt.




Series Motor L A with Series Shunt.




Series Motor L A without Shunt.

**Fig. 9.—Working Diagram for L A Motors: distance between stops 250 m: maximum speed 36 km. per hour.**

gradients our trains, composed of a regenerating motor-car of the L-type and a reversible trailer, effect an economy of 27 per cent. over similar trains with series motors working on the same route. On the line No. 25 (St. Cloud-St. Sulpice), which is practically level throughout its length, but on which there is much traffic congestion, our regenerating motor-cars of type G, without trailers, effect an economy of 23·8 per cent. over similar cars with series motors under the same conditions. Though these figures have been taken under conditions that were not so closely controlled as in the running tests, these savings are all the more interesting since they relate to service conditions and were obtained by a personnel that was not so closely supervised.

In the course of special tests recently carried out with our latest type of equipment with the most accurate apparatus and the greatest care, the nett energy consumed per ton km. for trains of type Ls-As, one with compound motors and one with series motors, following the first at a little distance and making the same stops, were respectively:—

Train with compound motor equipment, 35·2 w.h.;

Train with series motor equipment, 52·5 w.h.;

Net saving, 32·9 per cent.

As you will see, the energy consumed per ton km. for a line such as that from the Louvre to Versailles is 35·2 w.h., which is very small indeed and deserves special mention.

### Controller of Reduced Size.

I have already mentioned that, thanks to the elimination of the series-parallel transition, the controllers have been much simplified and could be built of smaller size with reduced weight and at a reduced cost. We have taken advantage of the application of the sliding contact to design and build in our own works a controller suited to these conditions. Here is one of these controllers fitted to one of our reversible trains. It weighs 90 kgs. against 145 kgs. for the old equipment. This controller provides for starting, normal running, regenerative braking, for rheostatic braking with the shunt field between 8 kms. per hour and standstill, for braking by short circuiting of the motors with series field but without shunt field. (This is obtained by the use of the reversing drum handle). It also contains the vitrified porcelain resistances which I have mentioned, as well as the resistance for shunting the series field. The leads leaving the controller are thus reduced to nine traction cables and one shunt field cable. For the purpose of comparison I have placed by the side of this controller, controller B.350X for the control of series motors of our L-type cars, which weighs 145 kg., and from which there come nineteen traction cables.

A glance at the two controllers gives you a good idea of the simplicity of compound motor equipments with permanent coupling of motors, not only compared with series motors with series parallel transition, but particularly with compound motor equipments with series-parallel transition. The following table shows in detail the reduction of weight obtained on our cars, which is almost entirely due to the abolition of the series-parallel transition.

| | |
|---|---|
| On the weight of the two controllers .. .. .. | 110 kg. |
| On the weight of the cabling .. .. .. .. | 95 ,, |
| On the weight of starting resistances .. .. | 55 ,, |
| By the abolition of shunting resistances of series motors .. .. .. .. .. .. | 45 ,, |
| By the abolition of several accessories: staples, insulating materials, wire clamps, etc. .. .. | 15 ,, |
| Total reduction .. .. .. | 320 kg. |

### Traction Equipment with Compound Motors Built by the Alsthom Company, for "L"-Type Cars on Paris Tramways.

The converted motors TH523 and TH563 clearly only represent an approximate solution of the search for an equipment perfectly adapted to our working conditions. It is a solution with which we are very satisfied because it gives us much better equipment with much lower running expenses, but there is still room for improvement on motors specially designed. For example, I will mention that our motors TH563 still have the original armatures and therefore involve ohmic losses which could be reduced, since the internal resistance has remained the same, although the average current in service has been increased by the conversion. In other words if we had spent more money on the transformation we could have obtained more satisfactory results.

With a view to having some new motors built we applied to the Alsthom Co., which as the combination of the French Thomson-Houston Co., and the Société Alsacienne de Constructions Electriques and Mécaniques possesses wide experience in the construction of compound motors. In fact since 1924 and 1925 these two firms have built compound motors for the well-known Renault-Alsacienne accumulator vehicles and rail-less cars with regenerative equipment for the Marseilles system. They have designed a first equipment which has just been delivered and which after many satisfactory bench tests has been fitted to one of our reversible trains, type Ls-As, which you will be able to try on the line Louvre-Versailles. Fig. 9 gives the characteristics of the motor TH600 of this equipment. Under 275 volts the two motors each develop an hourly rating of 35 H.P. with a speed of 495 r.p.m., and a continuous rating of 23 H.P., with a speed of 590 r.p.m.

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In order to build this motor, we used the frame of our motors TH563, series or compound, with a gear ratio of 10 to 1 against 7·21 to 1 for the compound motor TH563, and 6·27 to 1 for the series motor TH563. In consequence, the over-all size and weight are the same. The increase in power is obtained by the increase of the rotating speed which will be of 2,600 r.p.m. for a road speed of 40 kms. per hour. The complete equipment is shown in Fig. 10. It

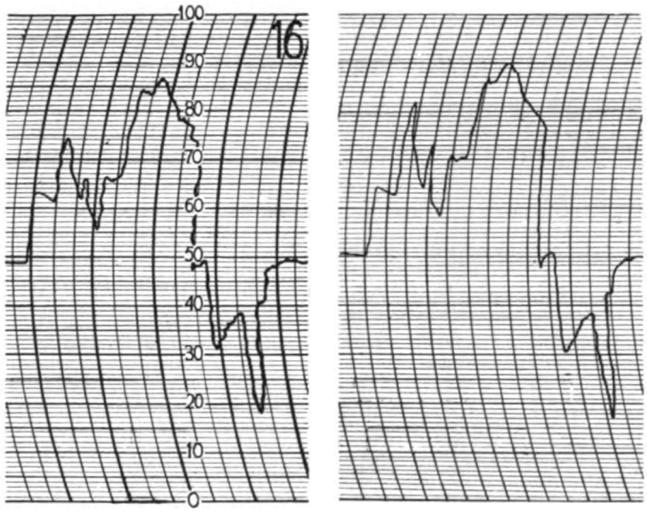


**Fig. 9.—Energy Curves of two coupled Motor Cars including Starting and Regenerating.**

is similar to the one we have ourselves designed, but for the details of construction and the use of a line breaker with overload relay and over-voltage relay connected at motor terminals. The value of the latter relay is not clear as our first series motors converted into compound motors have now run over 700,000 kms. without any over-voltage relay and we have had no trouble on that account.

Contrary to the arrangement in our equipment the controller in this one opens the shunt field circuit at each passage across the zero and connects to its terminals a discharging resistance. The line circuit breaker closes its contactor as soon as the reversing handle is placed in a running position either forward or back. It remains closed except in the event of braking by short-circuiting the motor (without shunt field) or on the working of the over-voltage relay. The working of that relay which is adjusted to 675 volts, involves the closing of the over-voltage contactor and inserting the whole of the rheostat in the shunt field circuit whatever may be the position of the main controller handle. The over-voltage contactor is fed by a 10-volt accumulator which provides for emergency lighting and the stopping electric bells' circuit. This entirely separate current allows the contactor to be interlocked and prevents the re-connection of the traction circuits so long as the speed of the vehicle is above 8 kms. per hour. The Alsthom equipment having only just been put into service, I cannot give you any figures for its current consumption, but from bench tests the results under working conditions should certainly be better than those we have obtained with our converted motors.

### Two and Three-Car Trains.

The necessity of carrying very variable numbers of passengers according to the time of day has until now justified the use of trailers. This method of operation, which entails smaller expenditure on wages than is necessary with motor-cars alone, has the disadvantage of not using the electrical equipment efficiently. In order not to be too powerful for the motor-car alone this equipment is generally rather weak for drawing trailers. This condition results in a reduction of working speed, and on lines where both single cars and trains are running, to serious irregularity in service. It is for this reason that the use of motor-cars, either alone or in double and multiple units, which enables the power to be exactly adjusted to its load is becoming more general. This system is also employed on the Underground railways but mainly in order to obtain rapid acceleration and deceleration by electric braking. We have, therefore, tried working our motor-cars with compound motors in double units. The tests have given every satisfaction, and we have put into service a train of three cars, including two motor-cars of our type-G, fitted with TH523 compound motors, and one trailer type A in the centre, giving a total capacity of 155 passengers. It can, moreover, be separated into one motor-car and one train (of motor-car and trailer), or into two coupled motor-cars or two separate motor-cars. With this variety of possibilities we have not considered the arrangement in series of all the motors of the train, and we have coupled the two motor-cars in parallel. The motors of each car are still in series. At first we were afraid that circulating currents might arise within the two traction circuits thus placed in parallel, either at starting or when running under unsaturated conditions or with regeneration. Simultaneous readings on two ammeters, showing the current taken from or returned to the line by each motor-car, prove that these fears were unfounded. The curves given in Fig. 9 relative to a complete starting and regenerating cycle upon two motor-cars of type-L coupled together are entirely reassuring. The examination of the commutators and of the temperatures of the motors have, moreover, completely confirmed this. It is easy to see that both in the case of absorption of energy and in that of regeneration the working is stable. Fig. 10 is a diagram of this equipment. It will be seen that the number of cables connecting the two cars is reduced to seven, six of which are traction circuits and one for the shunt field.

Each car is provided with two controllers K501X of a model used for the compound motor TH523, to the reversing drum of which the traction circuit leads of the other car have been connected, in order to allow the various couplings—forward and backward and emergency braking. Besides, each car is provided with two sets of starting resistances and two shunt circuit resistances which are respectively coupled in parallel for running with 4 motors. In consideration of the reduced weight of the resistances and rheostats, we preferred this simple solution to any other which would have entailed complicated cabling.

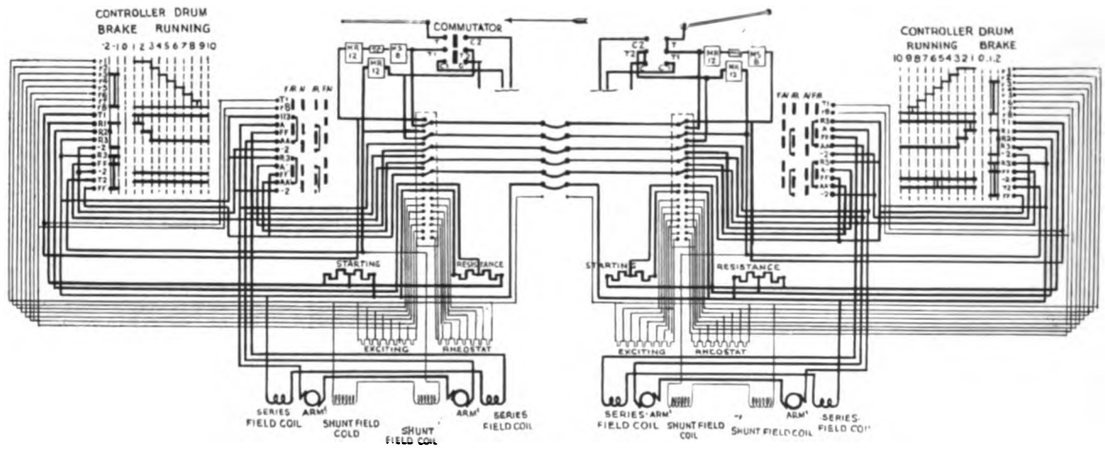


**Fig. 10.—Diagram of Equipment with two Coupled Motor Cars.**

Finally, a special combining apparatus placed in each motor-car near the driver's station provides by two positions for running on two motors or on four motors and enables all the circuit breakers and switches of the two or three cars in the train to be coupled in series. In the case of more than two motor-cars coupled together it is clearly desirable that an indirect control of the different cars should be adopted so as to avoid too heavy coupling connections. We are at present investigating this problem which seems as if it might afford a much more simple solution than that obtained by multiple unit equipment with series motors.

These are the advances we have made up to date, but with each

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fresh step our hopes run higher. I will summarise as I did at Warsaw the advantages of our new equipment which we hope to extend to the whole of our system.

(1) Reduction of current consumption (25 per cent.)* resulting from :—

(a) Reduction of rheostatic losses at starting ;
(b) Economical running at low and constant speed ;
(c) Regeneration of current on down-grades at the time of slowing and at stopping ;
(d) Easy driving not requiring so much skill.

(2) Reduction of maintenance expenses resulting from even starting and braking and from reduced wear of mechanical braking elements and of tyres.

(3) Increase of commercial speed by abolition of coasting.

(4) Electric braking ;

and finally owing to the abolition of the series-parallel transition :—

(5) Low equipment cost, low weight, and reduced over-all size.

To conclude, I should like to answer a question which has been put to me many times since our meeting in Warsaw. "We cannot, on account of their cost, buy new vehicles, but we should like to

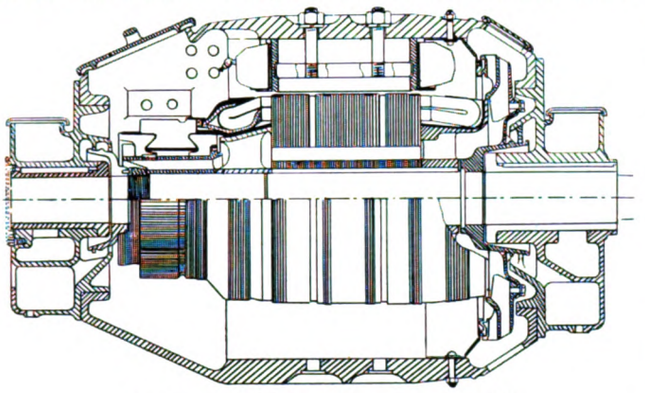

Fig. 11.—Ventilated Motor T.H. 523

convert our equipments with series motors into equipments with compound motors. Is this conversion possible, and how should we proceed ?" I will consider one or two cases.

First, that of old-type motors, large, heavy, with neither commutating poles nor autoventilation. A year ago I would have advised that they be immediately replaced by new series motors and that this expenditure would be quickly made good by the reduction in energy and upkeep charges. To-day I should advise all the more strongly that they should be replaced by new compound motors. The increase in power of a compound motor over the old series motor under the same working conditions is so great that there would be a large saving in energy owing to the reduction in weight of the vehicle. The control gear is similarly so much simpler that, except in very rare cases, the conversion is easily effected.

In the second place I shall consider the modern ventilated motor with commutating poles designed for rheostatic braking. In this case—that of our cars of the L-type—the increase in power can generally be obtained by increasing the gear ratio and if necessary by increasing the section of the copper in the armature windings by a better setting of the coils, but without otherwise changing the nature of the armature winding. The commutator can be changed from 600 to 300 volts without alteration. As for the field windings, I have already stated that our coils are not larger than those of the corresponding series motors.

The most common case is that of an unventilated, slow speed motor with commutating poles, a motor which would have been considered modern between 1910 and 1920, one with a speed of 400 to 600 revolutions per minute on a one hour rating. This case, which is similar to our motor TH523, is rather difficult. If we considered only brief periods, commutation, torque, speed, etc., the transformation would usually be simple and could be effected in the same way as that of modern ventilated motors, but it is more difficult when heating on continuous running is allowed for. The ratio of one-hour rating to continuous rating for these motors generally falls between 2 and 2·5, as against 1·3 to 1·5 for ventilated motors. The result is that for equal one-hour ratings the continuous rating power of non-ventilated motors is much lower than that of ventilated motors and this despite a greater weight which gives them a fictitious appearance of higher thermal capacity. In the case of such border line motors, after adjustment of gear ratio and armature windings, there remains the application of insulating material with equal dielectric power but capable of withstanding high temperatures. We have recently prepared wire with asbestos insulation which has satisfactorily withstood temperatures of 350° C. in our laboratories. Such a temperature is never likely to be reached under working conditions, so windings of this type should in many cases make possible the conversion of motors to obtain the benefits of regeneration. Finally, there is the possibility of introducing ventilation into the motor, and this is not so difficult in most cases as one would think. Fig. 11 shows how for experimental purposes we have arranged for ventilation in one of our motors, TH523, whose weight is 1,250 kg. The increase of continuous power obtained in this way amounts to 35 per cent.

I wish I could give a simple answer to another question that has come to me from many sources since the Warsaw meeting. That is : "Where conversion is possible, how are the field coils to be designed for this purpose ?" This problem cannot unfortunately be put into an equation. The ratio $\frac{N \times I}{n \times i}$ of the series ampere turns to shunt ampere turns, for which it is already difficult to determine the values $I$ and $i$, may vary, not only together with the operating conditions, but also with all the special features of the motor. In order to answer the question, we must know all factors relating to each particular case. Therefore, I can only put myself at the disposal of those among you who are interested in that question, to investigate the characteristics of the motors to be converted and their working conditions.

It is only after considering these various factors that I could apply to each motor the results of our experiments, and suggest values for $N$ and $n$, and the gauge of wire to be used.

* This figure will undoubtedly be increased when using specially designed equipment.

## MEETING IN PARIS TO DISCUSS REGENERATIVE CONTROL.

The special meeting of the International Tramways, Light Railways, and Public Motor Transport Union, which was held in Paris on October 21 and 22, was attended by about 200 members from many European countries. The object was to study and inspect the system of regenerative control designed for and applied to some 40 cars of the Paris Public Transport Company (Société des Transports en Commun de la Région Parisienne). After experimental operation extending over a considerable period, M. Bacqueyrisse, Director General of operation and Technical Services of the Company, made a report to the International Union at its Congress at Warsaw in July last. So much interest was then manifested by the members that M. Mariage, the President of the Paris Company, offered to arrange for a special meeting to be held in Paris to inspect the system and investigate the results obtained. The invitation was accepted, and the Paris Company, at whose offices the meeting was held, made all the necessary arrangements. Among those who attended were a number of representatives of British municipal tramways and others, who were present in response to the invitation which M. Frédéric de Lancker, the President of the Union, extended to them at the annual Conference at Harrogate.

M. Mariage, in opening the meeting on the Tuesday morning, extended a cordial welcome to the delegates, which was acknowledged by M. F. de Lancker, who expressed the thanks of the members to the Paris Transport Company for the opportunity afforded to them of inspecting the equipments for regenerative control.

M. Bacqueyrisse then read his paper describing the regenerative control equipment with compound motors of the Société des Transports en Commun de la Région Parisienne, in which he stated that a saving of energy of from 25 to 30 per cent. was being obtained by his company by the use of the system. The paper amplified and brought up to date the report which M. Bacqueyrisse made to the Congress at Warsaw, and a translation of it is given in preceding pages of this issue.

The discussion on the paper was opened by Herr Mattersdorff, of the Hamburg Tramways, who said that the representatives of German tramway undertakings had been studying the operation of regenerative equipment in four cities, viz., Chemnitz, Nuremburg, Marseilles, and Paris, and had drawn up a report, which it was hoped shortly to publish. Herr Mattersdorff gave a brief account of the regenerative systems in use at Chemnitz and Nuremburg. He then presented several questions on the application of regenerative control. The first question was : "In view of the possibility of disconnection with the power line, e.g., displacement of the trolley, does the system need to be supplemented by an independent brake, either a compressed air brake or a rheostatic brake ?"

M. Bacqueyrisse replied that the Paris cars fitted with regenerative control were also equipped with air brakes. In any case, the braking was not effective below a speed of six kilometres per hour. Therefore, once the car had been brought down to this speed, either by the regenerator or by the rheostatic brake, the air brakes were applied.

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M. ZEHNDER, of the Montreux-Bernese Oberland Mountain Railway, expressed the view that auxiliary air braking was essential in the case of heavy trains of vehicles, both on railways and tramways. He remarked, however, that the experience of air brakes used alone had shown that brake shoes sometimes became heated to dangerous temperatures. M. Bacqueyrisse, referring to the question of the displacement of the trolley when a car is in motion, said that the most satisfactory solution had been found in the fitting of air brakes; but they were still looking for an adequate substitute which would obviate the high cost of providing and maintaining air brakes. In reply to another question, M. Bacqueyrisse said no difficulty was experienced in cutting off current in order to pass over a junction in the trolley wire. The controller handle could be brought back to zero in the ordinary way without entailing any braking effect.

While the discussion of the paper was being carried on in French and German, the British delegates withdrew in order to discuss the subject of the paper in a separate room, Mr. G. H. Fletcher, Chief Engineer and Manager of the Traction Works of the Metropolitan-Vickers Electrical Company, Ltd., spoke at length in this discussion, in which several other British representatives took part. On their return to the general meeting, the British representatives were welcomed by the President on behalf of the Union. Mr. R. STUART PILCHER, President of the Municipal Tramways and Transport Association, briefly replied on behalf of the British delegation, and introduced Mr. Fletcher, who summarised the views of the British delegates, his remarks being subsequently rendered in French and German.

### MR. G. H. FLETCHER PRESENTS BRITISH POINT OF VIEW

MR. G. H. FLETCHER, Chief Engineer and Manager of the Traction Works of the Metropolitan-Vickers Electrical Co., Sheffield, said:—

I would like to express the thanks of the British Delegation to Mr. Bacquerisse not only for putting before the tramway world the results of his experiments but also for so kindly keeping them up-to-date with the improvements and modifications which the further progress of his experiments has suggested.

In the meeting which the British Delegates attended in another room I suggested that it is necessary to eliminate from our minds the prejudice which was caused by the failure of the scheme of regeneration which was tried by Mr. Raworth in England between 1904 and 1907 because the development and design of railway motors, particularly with regard to the interpoles and ventilation, has altered the complexion of the whole problem, and made at least possible a design of motor which may operate satisfactorily.

The British Delegates have been considering this matter from the point of view of conditions of operation in Britain, which are in many ways somewhat different from the conditions prevailing in Paris. In Great Britain many of the larger systems have during recent years re-equipped their tramcars with lightweight motors, *i.e.*, motors, weighing only about 30 lb. per h.p. or less, and using in most cases absolutely the maximum gear ratio that can be used.

Furthermore, rheostatic braking is not used on the English tramcars. There are cases where the motor acts as a generator during the braking operation, and supplies current to track brakes, and although some heating of the motor naturally results from supplying the energy for this purpose, a large proportion of the kinetic energy stored in the car is transformed into mechanical energy at the track brake, and only a small proportion transformed through the motor.

Bearing these points in consideration, the additional service required of the motor for regenerative operation would be very considerable, and according to curves shown in the paper presented by Mr. Bacquerisse before the Congress of the International Union of Tramways and Light Railways in June, 1930, would result in an increase in the rating of the motor by something in the nature of 60 per cent.

The question which immediately occurred to my mind was how could the Paris System use the same motor in view of these circumstances, and I think the answer is to be found in the change of gear ratio, as it would appear that the gear ratio has been changed to give an increase in speed of 39 per cent. on one motor and 59 per cent. on the other motor. Also I understand that the motors were already too large, and the margins of rating which existed have been drawn upon to some extent.

These changes in gear ratio have been possible because the motors were already fitted with double reduction gearing. In the case of motors which are already manufactured and in use, no adequate increase in gear ratio is possible; and, although the motors now in use in England are more than ample for their present service, I think it is quite certain that there is an insufficient margin to perform the additional duties required if re-wired or re-wound for regeneration according to the Paris scheme, and I am afraid that any question of making any considerable increase in gear ratio is out of the question, as it would involve the provision of new frames.

The question therefore for the British tramway engineer is one of balancing the gains which may be expected by reduction of current consumption against the cost of new equipments with increased capacity, and therefore increased weight; and I think there is no question that in the case of cars already equipped with modern motors the gain, even from a most optimistic point of view, would not be sufficient to justify the scrapping of comparatively new and modern motors. In the case of cars equipped with motors which may be obsolescent, the question is entirely different, and the problem is well worth consideration.

The value of regeneration depends naturally upon the price of current, and I think one can say that where the price is as low as .53d. per unit as in Glasgow, the saving based on 25 per cent. reduced current consumption would show a very small return after the interest depreciation, and maintenance on the additional capital required for the larger motors has been deducted, taking into account the reduced life of gears due to their double duty and the cost of carrying about additional weight. Where the current costs as much as 1d. per unit, the gain based on 25 per cent. reduction of energy is more encouraging, and after making fair allowance for the increased charges mentioned above, the expected gain may be in the nature of about £43 per car per annum.

In an examination of this question due consideration will have to be given to the fact that the routes in many of the cities of Britain are very different from the route Louvre to Versailles. This route does not pass through Paris itself, whereas the majority of routes in the English cities pass through the city itself, and have to combine a city service with an urban or suburban route. In other words, the city service will probably be on the average rather slower than the service in Paris whereas on the routes outside the city itself, the speeds on the British systems are considerably higher and tramway engineers expect, and obtain, speeds of 30 miles per hour or more.

From the point of view of regeneration, according to the Paris scheme the criterion is the ratio of the maximum speed required to the minimum speed at which regeneration can be obtained. This ratio can only be extended by increasing still further the requirements for the motors and therefore the weight and cost.

If higher speeds are required than those obtained on the Paris system, then for the same size of motor the speed at which regeneration could be obtained will be higher and the energy returned to the line considerably reduced. I fear, therefore, that on British systems the same reduction in current consumption cannot be expected as is obtained in Paris.

A further point is the question of acceleration. During recent years British tramway undertakings have insisted on higher acceleration, higher maximum speeds and higher schedule speeds. Higher acceleration beyond a point at which the characteristic curve is reached can only be obtained at the expense of higher copper losses in the motor, because for a given torque an increase in speed can only be obtained by reducing the field strength and increasing the current of the armature.

As compared with a series-parallel scheme, double speed can be obtained by connecting motors in parallel and one can double speed at the same tractive effort for the same armature current, and, therefore, for the same copper loss, whereas in the series connection double speed for the same tractive effort can only be obtained by reducing the field to half, increasing the current to twice and the armature copper loss four times.

An examination of the characteristic curves show that an attempt is made to keep the current within reasonable limits by reducing the rate of acceleration. Of course it is true that provision can be made in the motor by providing sufficient section of copper to get the higher current, but this of course increases the size and cost of the motor.

The tests which we have witnessed on the cars in Paris demonstrated how simple is the operation of the controller and how complete is the control of the vehicle by the driver; and certainly the facts presented by Mr. Bacqueyrisse in his paper, together with a demonstration, will encourage the engineers in Britain who are interested in tramways to make the fullest investigation of the system.

With regard to the question which Mr. Bacqueyrisse raises in his paper regarding the relative weight of a 300-volt motor designed for 600-volt line, and a 600-volt motor designed for the same line voltage, I am afraid I cannot agree that the comparison will show the lower voltage motor to advantage. Certainly we have not found that this can be realised because in the main the largest influence on the armatures concerned is the question of insulation to ground and creepage distances which is determined of course by the line voltage. Any slight reduction in insulation due to the reduced number of conductors is usually more than offset by the increased weight of the commutator, collector gear and cables, due to the heavier current at the half voltage.

From the point of view of electrical performance, however, there is no doubt whatever that two motors with 300 volts per commutator

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would be much better to deal with than 600 volts per commutator, owing to the reduced segmental voltage and reduced voltage between positive and negative brushes, both of which factors are important from the point of view of flashover. I am inclined to agree, therefore, with Mr. Bacqueyrisse that if one is to choose between motors connected permanently in series and motors permanently in parallel the former scheme is superior from the point of view of electrical operation.

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On adjournment of the meeting, the delegates proceeded to the Hotel Continental for luncheon at the invitation of the S.T.C.R.P., when over 200 delegates and other guests enjoyed the hospitality of the company. M. Mariage, of the Paris Transport Company, presided, and speeches were made by the Prefect of the Department of the Seine, and M. de Lancker, President of the International Union. The latter made a cordial allusion to the presence of the British delegation, and Mr. R. Stuart Pilcher expressed the thanks of those who had crossed the channel for the invitation that had been extended to them to see what was being done in Paris to extend and intensify the utility of tramways. In concluding his remarks, Mr. Pilcher made an impressive allusion to the sympathy extended by the people of France to Britain in the loss of those who had perished in R 101, saying that this calamity would tend to strengthen the bonds of goodwill between the two nations.

Later in the afternoon tests were made on the tramway route from the Louvre to Versailles with cars equipped with the compound motors and the regenerative control system. Previously the car trucks fitted with motors equipped for regenerative control were inspected at the shops of the company where many of the old motors had been reconstructed. The latest motors have, however, been specially built by the Alsthom Company. The cars used in the tests were fitted with meters and recording instruments so that the action of the motors, both when consuming and regenerating current, could be followed as the cars proceeded. The change from one operation to the other was made with great frequency, and it was demonstrated that a considerable saving in the energy taken from the line was being effected.

On the following day (October 22) the delegates who remained were received by the Versailles Electric Tramways and Power Company, on whose lines tests were carried out of the regenerative control system as applied to series-parallel motors. After luncheon at the Hotel des Reservoirs, as the guests of the Versailles Tramways Company, the delegates visited the Chateau and the Trianons, returning to Paris in the evening.

A final meeting was then held at the offices of the Paris Transport Company, when the discussion was continued. Among the speakers was Mr. W. A. Stevens, whose remarks are given below in full.

### Mr. W. A. Stevens on Regenerative Control with Trolly Buses

Having experimented on regeneration from electrical machines for the last twenty-five years, first on battery vehicles and then on trackless trolley vehicles, I am in a position heartily to congratulate Mr. Bacqueyrisse on his able paper and the results he has obtained on the Paris Tramways. Yesterday I had an opportunity of observing an extended test on one of these vehicles with a recording voltmeter and ammeter in the circuits, also of watching one of the commutators under all conditions of driving, regeneration, and rheostatic braking, and can testify that the author of the paper has achieved all that he has claimed.

I agree with Mr. Bacqueyrisse that, although two motors are necessary in tramcars, where it is possible—as in the case of a trolley bus—to employ one motor, that is the better arrangement. I also agree that at slow speeds the return from regeneration is so small that it is not worth discussing, and for this reason I suggest that it might be an improvement to reduce the air-gap in the motor. This would probably reduce the range of speed from 5 to 1 to 4 to 1, raising the lower regenerative limit from 5 to 6.25 miles per hour—but this would have the advantage of increasing the efficiency of the machine from 84 per cent. to 88 per cent. The commercial efficiency of the compound wound regenerative machine on the "Guy" trolley omnibus, which has a still smaller air-gap, with a speed ratio of about 3 to 1, is well over 90 per cent. The advantage of the compound-wound machine, so ably set forth by Mr. Bacqueyrisse, impressed itself on several members of the British deputation, especially in the fact that a large range of economical running speeds are available as compared with the two positions, not always used, in the series-parallel arrangement when two series motors are used.

In the development of the "Guy" trolleybus which uses the regenerative system, we have found that by automatically short-circuiting the series field of the motor when regeneration is taking place and even compounding it until it attains a level characteristic as a generator, the regenerative effects are greatly increased and, in an emergency, 180 amperes can be returned to the line with powerful, but quite smooth, braking effects. It is necessary, in this case, to have an arrangement which automatically inserts a resistance in the lighting circuit, otherwise the lamps would be damaged.

As regards economy, I can fully endorse the claims of the author of the paper from experience with large fleets of regenerative trolley omnibuses running in England during the past four years, notably in Wolverhampton, Hastings, and South Lancashire. I have permission from Mr. Silvers, General Manager of the Wolverhampton Municipal Transport Department, to record an economy of 20 per cent. on his fleet of 38 double-deckers; and Mr. Edwardes, General Manager of the South Lancashire Tramways, has authorised me to state that his experience of operating 60-seater trolleybuses on the regenerative system is entirely satisfactory, his current consumption averaging 1.52 units per mile, the laden weight of vehicle being 11 tons 19 cwts. No vehicles fitted with series-wound motors can approach this efficiency.

Raworth, who was one of the early pioneers of the regenerative system for tramcars, should have our sympathy in that his invention was brought out before the days of the perfection of the interpole motor, and the trouble he had with sparking and overheating, due to the instability of the neutral point, has given a bad name to regeneration which, under present conditions, it does not deserve.

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## TRAMWAY AND LIGHT RAILWAY NOTES.

### BELFAST.

New Cars Arriving—A Labour View of the Tramways.

The first of fifty new tramcars has been delivered, and twenty-five, which have been ordered from the Brush Electrical Engineering Co., Ltd., will probably be running by December, when an equal number of old cars will be scrapped. The new cars are of the totally enclosed type and seat 68 persons. The upper saloon is electrically heated. There are transverse seats in both saloons, and the upholstery is in leather, the cars are equipped with two motors of 58 H.P. each, have roller bearings, and all moving parts of the truck are fitted with a grease-gun system similar to that of private motor cars. Air brakes are fitted which in an emergency may be applied by the conductor. At a meeting of the Trades and Labour Council, Mr. A. Ryan (Amalgamated Transport and General Workers' Union) said that Mr. Chamberlain, manager of Corporation Tramways, had rationalised the system, with the result that he had obtained a much greater car mileage. The management had also spent more in wages, but reduced the cost of travelling to the public. Municipal rationalisation in Belfast had resulted in more employment and cheaper travelling facilities.

### BLACKPOOL.

Illuminations Swell Tramcar Receipts.

During September, when the illuminations were in full swing, the tramcars carried 6,500,000 passengers, the receipts totalling £50,000. For the corresponding period in 1924, when there were no illuminations, there were less than 3,000,000 passengers, and under £20,000 in revenue.

### COLWYN BAY.

A Sunday Tramcar Service.

A Sunday service of tramcars was started at Colwyn Bay on November 9, including a through service to Llandudno. Hitherto the company's agreement with the Council prevented the running of cars on Sundays, but following a recent vote of the ratepayers in favour of a limited service of omnibuses on Sundays and the doubling of the track on the reconstructed Conway Road, the Council has waived this part of the agreement. The decision is subject to revision in twelve months.

### COVENTRY.

New Cars Proposal Referred Back—Fares Revision.

The Corporation, by 24 votes to 23, has referred back a recommendation by the Transport Committee to purchase five new tramcars. Opponents of the proposal expressed a preference for omnibuses. In reply, Councillor O. M. Flinn, chairman of the Committee, stated that if all the cars were replaced by omnibuses at least another £20,000 would be added per annum to interest and sinking fund payments, bringing the total to £61,000 a year. All large towns were buying new cars, which showed that they did not regard them as obsolete. Councillor T. J. Harris stated, in connection with the recent fares revision, that although fares for the short stages had been lowered, those for the long stages had been raised, and that if this was represented as a reduction the public had been deceived. Councillor O. M. Flinn, replied that 80 per cent. of the passengers were paying less, although 20 per cent. might be paying the same or more. It was almost certain that there would have to be a return to the old fares in January.

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## CROYDON.

IMPROVED CARS.

The last of the ten bogie truck cars run on the Thornton Heath route of Croydon Corporation Tramways has been fitted with a top cover. The fitting of the top covers was carried out at the tramways depot, and the ten cars have been entirely modernised.

## DUNDEE.

NEW LUXURY CARS—DEPOT EXTENSIONS.

The first of ten new cars of the Corporation Tramways has been delivered. They are being constructed by the Brush Electrical Engineering Co., Ltd., of Loughborough, and are luxuriously furnished. Chromium plating and hide upholstery are two features. The new cars, which have been designed by Mr. D. P. Morrison, the general manager, accommodate 68 passengers, as compared with 54 in existing cars. There is a larger platform at each end to facilitate loading and unloading. Electric heaters are provided in both saloons. The tramway depot in Lochee Road is to be enlarged. Plans are being prepared by the city engineer.

## GLASGOW.

COST OF COUNCILLORS' PASSES.

The City Chamberlain reported to a meeting of the General Finance Committee that the cost for the current year of free travelling passes on the tramcars issued to members of the Corporation would be £565.

## HULL.

TRAMWAYS TO GO OVER NEW BRIDGE.

The City Council has approved the Tramways Committee's recommendation for the tramways to be extended over the new North Bridge and the approach roads at an estimated cost, with overhead equipment, of £10,000. Alderman Stark said the Committee realised that some other form of transport would eventually have to be introduced, but £500,000 was still owing on the undertaking, and there were new lines on the routes with which the lines on the bridge would connect. More money had been granted by the undertaking in relief of rates than would have paid the loans.

## KIRKCALDY.

OFFER TO BUY THE TRAMWAYS.

Messrs. Cormie Brothers, a local firm of omnibus proprietors, have offered to buy the Corporation tramway undertaking for £20,000. A decision has been deferred pending reports from officials in connection with the request of the Council for recommendations on an alternative method of transport. As we have already reported, the Council has decided to discontinue the tramways. The Council has also informed the Wemyss and District Tramway Co. that there is a possibility of their applying to Parliament for an order to abandon the tramway service and asking if the company has any proposal to put before the Council.

## LIVERPOOL.

TWELVE NEW CARS ORDERED—STREET SUBSIDENCE CLOSES ROUTE.

Speaking at a local meeting Sir Thomas White said they were always investigating ways and means for improving the rolling stock and service of the tramways. They had just ordered twelve 8-wheel tramcars as the forerunners of a fleet that would give greater comfort and speed. Owing to a subsidence in Dale Street one of the main central routes was suddenly closed to all traffic just before the morning rush hour on October 29. Mr. P. Priestly, the transport manager, stated that 274 tramcars had to be diverted, but by 10 o'clock all the orders had been given and new time-tables made out and distributed.

## LONDON.

NEW M.E.T. CARS—FOG LAMPS FOR L.C.C. CARS—LEYTON AGREEMENT—NEW TRAVERSERS—STORES STOCK—OFFICIAL'S PATENT FOR PAVING BLOCKS.

Middlesex County Council agreed on October 30 to the purchase by the Metropolitan Electric Tramways, Ltd., of 54 new cars, at a cost of about £3,000 each; the company propose to extend their depot at Finchley. London County Council Tramways Department has decided to fix fog lamps of an improved type to the 150 new cars now being delivered. Under a supplementary agreement between the L.C.C. and the Leyton Corporation the latter will receive 75 per cent. of the share of the surplus on working and will pay to the L.C.C. 75 per cent. of its share in any loss. Tenders have been invited by the L.C.C. from selected firms for five new traversers for car depots, the cost being estimated at £6,000. The L.C.C. has agreed that stores and material to the value of £229,000 should be kept in the Tramways Department during the current financial year.

## LYTHAM ST. ANNES.

TRAMWAYS FUTURE—REDUCED RETURN FARES.

Referring to the loss of £6,712 on the tramways last year, the Mayor (Councillor A. J. Price) has said that if they scrapped the system they would still have to meet £11,000 a year for interest and sinking fund. Although omnibuses had proved more economical, tramcars had the advantage in carrying peak loads. The Council would consider the alternative of trolleybuses, and although that system did away with track expenses and was safer for passengers, it increased the cost of road upkeep. The Town Council has decided to extend the experimental period of reduced return fares to Blackpool after 5.30 p.m. until November 30, and return fares at reduced fares in the borough until December 31.

## NORWICH.

PURCHASE OF TRAMWAYS TOO COSTLY.

A committee which was appointed by City Council to consider transport problems and the purchase of the tramways undertaking has presented a report which has been approved by the Council. The report advises the exclusion of certain classes of vehicles from certain streets, that the purchase of the tramways would be too costly, and that in any Bill promoted by the Corporation steps should be taken to secure powers to run omnibus services. At present the Tramway Company has a monopoly under their Act.

## PLYMOUTH.

FUTURE OF THE TRAMWAYS.

Alderman Miller, chairman of Plymouth City Transport Committee, states that the time is near for deciding whether tramways are to be abandoned in the city and some new means of transport adopted. He states that 75 per cent. of the track needs reconstruction, and the cost would be from £15,000 to £17,000 per mile. There is also a large capital outlay to be paid off

## PORTSMOUTH.

PROPOSED TROLLEYBUS SERVICE.

At a meeting of the City Council on October 28, Alderman Sir John Timpson, chairman of the Tramways Committee, stated in reply to a question as to when the tramway lines in Fawcett Road would be renewed, that the Committee were anxious to consider installing a trolleybus service which could be continued to Greetham Street, and as far as the Unicorn Gates of the Dockyard. It was further stated by the chairman of the Roads and Works Committee that when the tramway track was removed Fawcett Road would be reconstructed on modern lines.

## SWANSEA.

TRADERS WANT IMPROVED TRAMWAY FACILITIES.

Mr. David James, J.P., managing director of Swansea Improvements and Tramways Co., has promised a deputation from the Chamber of Trade to give serious consideration to suggestions for additional tramcars at certain times and to experiment with loading arrangements to prevent tramcars being "rushed" by young men before stopping places are reached.

## TORQUAY.

ANOTHER BILL PROPOSED.

The Torquay Tramway Bill Special Committee has received a letter from Mr. W. B. Cownie, managing director of Torquay Tramways Co., stating that he is prepared to recommend his directors to promote another Bill next session. It would include the provision that the works, if authorised, would not start until December 31, 1931, so that the question of purchase or non-purchase of the undertaking might be before the electors at two elections. If the Council were satisfied that the ratepayers desired to purchase, he would recommend that the company should give the right of purchase by six months' notice from any date in 1931. By this offer the Corporation would also take over the trolleybus powers, if obtained, but these must have no bearing on the price to be settled, which must be strictly in accordance with the terms of the Act. The Committee having asked for a probable price, Mr. Cownie gave his personal opinion that the probable price would be £330,000.

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ECONOMY FOR SERVICES IN BERLIN.—The Berlin Underground Railway, Tramway and Omnibus Undertaking is effecting every possible economy in the operation of the services. The salary of the managing director has been reduced from £6,000 a year to £2,500 and those of other directors have been halved. It is anticipated that other transport organisations in Germany will follow this example.

OIL ELECTRIC CARS IN U.S.A.—A Reuter's message from New York states that the first of the new oil-electric cars made by the Westinghouse Company for the Erie Railway has been put in service. The car is equipped with two Diesel engines driving two Westinghouse generators capable of a maximum speed of 85 M.P.H. It is said to be able to run 1,000 miles without refuelling.

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## PERSONAL.

**Mr. J. H. Lowe,** of Grey Coaches, has been elected chairman of the Motor Hirers' and Coach Services Association.

**Mr. Samuel Gluckstein** has been appointed a member of the Special Committee of the London County Council on Traffic.

**Alderman W. Eaton,** formerly for a considerable period chairman of Derby Tramways Committee, has resigned his seat on the Town Council.

**Major J. Caldwell,** a former managing director of Alloy Welding Processes, Ltd., has resigned his position as chairman of the company, and has left London for an extended world tour.

**M. Bonhomme,** director of Industrial and Commercial Motor Transport, and a director of many other motor transport companies, has been made a Chevalier of the Legion of Honour.

**Alderman Thorpe** has been nominated to represent the Ripon City Council on the panel from which the Commissioner will be selected for the Yorkshire Traffic area under the Road Traffic Act.

**Mr. Fred Bland** has been re-elected unopposed as a member of Sheffield City Council. Mr. Bland sits as Conservative member for Ecclesall. Only two other members were returned unopposed.

**Mr. S. B. Jackson,** of the North Metropolitan Electric Power Supply Company, has been appointed regional control engineer of the South-East England scheme of the Central Electricity Board.

**Mr. G. F. Cole** has been appointed chief engineer and manager of the Electric Supply Co. of Victoria, in succession to the late Mr. P. J. Pringle. For some years Mr. Cole has been the resident engineer in Bendigo.

**Mr. John Christie** has been presented with a gold watch by the Brighton Electricity Works Social Club upon his retirement from the position of borough electrical engineer. To Mrs. Christie a handbag was presented.

**Councillor A. Aplin,** who was selected by the Labour Party of Deptford Borough Council for election as Mayor, is secretary of the Transport and General Workers' Union. He has been a member of the Council for eleven years.

**Mr. M. V. Everton,** London manager for the lamp sales department of Metropolitan Vickers Electrical Company, Ltd., has been appointed sales manager for that department at the headquarters of the company at Bush House.

**Mr. W. Vane Morland,** general manager and engineer of Walsall Corporation Tramway and Motor Services, has been voted a payment of 100 guineas for special services to the Corporation in the promotion of the Walsall Corporation Bill, 1930.

**Mr. A. McD. Gordon** has been appointed to represent the London County Council on the Railway Assessment Authority. This body has been set up by the Minister of Health under the Railways (Valuation for Rating) Act, which received the Royal Assent in July last.

**M. Coste,** the president of the Railway and Motor Transport Union of France, has been promoted to the grade of Officer of the Legion of Honour. M. Coste was one of the founders of the union, of which he has remained for many years the General Secretary and Legal Counsel.

**Sir James Lithgow, Bart.,** one of the original members of the Central Electricity Board appointed in 1927, has resigned owing to the pressure of his other duties, and the Minister of Transport has appointed in his place Sir Ralph Lewis Wedgwood, chief general manager, London & North-Eastern Railway Company.

**Mr. L. V. Kenward,** who has during the past twenty years occupied various positions with the Dunlop Rubber Company and latterly that of general sales director, has been appointed general manager of subsidiary companies. Mr. Kenward will retain his seat on the Fort Dunlop local board which deals with tyre questions.

**Mr. L. V. Williams,** who was formerly attached to the Birmingham depot of the Associated Equipment Co., and is well known in the Midland counties, has been appointed to represent that company throughout North Staffordshire. His headquarters are at the new branch premises at Halifax Chambers, Market Square, Hanley.

**Mr. E. W. Chalmers,** civil engineer and inventor of the Kearney high-speed railway, has been on a visit to Sydney, where he discussed with the State Government the proposal by the Kearney High-Speed Tube Railway Co., of which he is the engineer and managing director, to construct a railway from North Sydney to Newport.

**Mr. G. H. Moran,** of the electrical branch of the Victorian Railways, has returned to Melbourne from two years' leave, granted to enable him to study railway working and power-house construction in Switzerland. He was attached to the Brown-Boveri Corporation at Baden, Switzerland, and his particular studies covered electric locomotives.

**Mr. A. H. Hawkins,** managing director of the East Surrey Traction Co., has become operating manager of the Green Line Coaches, the London General Omnibus Company's subsidiary, comprising the East Surrey, the Autocar and the Green Line services. Mr. J. H. Rutland has been appointed assistant operating manager.

**Sir Henry Fowler,** chief mechanical engineer of the L.M.S., has been appointed assistant to the vice-president for works as from January 1, next year. The company intends that Sir Henry's wide knowledge and experience shall be devoted mainly to research and development. He will take charge of the laboratories and the central testing bureau.

**Major T. H. Vitty,** who recently resigned the appointment of chief of the engineering branch of the Metropolitan Police, which he had held for ten years, has joined the firm of W. and G. du Cros, Ltd., manufacturers of motor cabs, saloon coaches, commercial vehicles, and ambulances. His first task is the development of a day and night service depot.

**Mr. T. Stirk,** traffic superintendent, Bradford Corporation Tramways, has been appointed acting tramways manager until such time as a new manager takes office. Mr. R. H. Wilkinson, the retiring manager and engineer, has been granted a retiring allowance. The Committee advertised for a successor at a minimum salary of £1,250, rising to a maximum of £1,750 per annum.

**Mr. Percy E. Rycroft** has resigned his position with Babcock and Wilcox, Ltd., to accept the appointment of general engineer and manager of Great Yarmouth Corporation electricity undertaking. He succeeds Mr. P. G. Campling, who was recently elected district engineer for East England under the Central Electricity Board. There were 93 applicants, and Mr. Rycroft's election was unanimous.

**Mr. Wm. Forbes,** general manager of Cardiff Tramways and Omnibuses, at a recent meeting of the Tramways Committee was congratulated upon the gradual improvement that is being effected in the working of the department. It was mentioned that the department has a new liability of £14,000 in respect of superannuation, and as a help to meet this there has been a saving of £15,114 in working expenses, brought about by the general manager.

**Sir Ernest Clark,** a director of the Underground Group of railways and the London General Omnibus Co., has been elected a director of Messrs. Harland & Wolff, shipbuilders and engineers. Sir Ernest served as Permanent Secretary to the Treasury of Northern Ireland, has been Assistant Secretary to the Inland Revenue, Secretary of the Royal Commission on Income Tax, and Assistant Under-Secretary for Ireland. In earlier life he was a lawyer and in 1904-5 his services were lent to the Cape Government.

**Mr. Roger Gibb,** who has relinquished his position with the Great Western Railway on his appointment as chairman of the Rhodesian Railway Commission, had held the post of assistant to the assistant goods manager (Rates) since January, 1927. Mr. Gibb, who is also a barrister-at-law, first joined the G.W.R. in 1908, and has also seen railway service in Canada and the United States. He is a gold medallist of the Institute of Transport and a Fellow of the Royal Statistical Society and of the Royal Economic Society.

**Mr. T. Molyneux,** deputy city engineer of Liverpool, has been appointed city engineer in succession to Mr. T. Pierson Frank, who at the end of the year is taking up his new appointment as chief engineer to the London County Council. During nearly 25 years' service with Liverpool Corporation Mr. Molyneux has been engaged in all sections of the department's work, including the laying of 170 miles of tramway track. He was responsible for the £5,000,000 programme of relief works which is to be carried out during the next few years.

**Mr. P. G. Campling** has been presented with an oak bureau and bookcase by the staff and employees of the Great Yarmouth Electricity Department to mark his appointment as district engineer under the East England electricity scheme. Coun. Knights, chairman of the Electricity Committee, expressed the indebtedness of the borough to Mr. Campling for his work as electrical engineer. Mr. Campling, in reply, mentioned that ten boilers and ten generating sets had been scrapped during his six years' service to make way for new and efficient machinery, the supply station having been practically rebuilt.

**Sir Harold Hartley,** vice-president and director of research to the L.M.S. Railway, speaking as the newly-elected president of the British Cast Iron Research Association, on October 29, remarked that the growing place of research in industrial economy was shown by Canada, Australia and India having sent research representatives to the Imperial Conference. Two developments for which this Association had been responsible were the systematic control of moulding sands, and the introduction of the balanced blast cupola. These developments would probably result in an annual saving to the trade of at least £200,000.

**Mr. Clifford C. Paterson, O.B.E., M.Inst.C.E., F.Inst.P.,** has been elected President of the Institution of Electrical Engineers. The appointment is appropriate in view of the International Illumination Congress to be held in this country next September. Mr.

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Paterson is President of the International Commission on Illumination, of which body he was for fifteen years hon. secretary. He is chairman of the Illumination Committee of the Department of Scientific and Industrial Research and chairman of the Street Lighting Committee and the Electric Lamp Committee of the British Engineering Standards Association. In the first year of the war he was responsible, with Dr. J. W. T. Walsh, for the invention of an electrical height finder which automatically recorded the heights of aircraft for use in the anti-aircraft gunnery.

**Mr. H. A. Blackburn's** resignation of the position of general manager of Keighley Corporation Tramways, upon appointment as transport manager at Great Yarmouth, was referred to by the Mayor at the October Council meeting. The Mayor remarked that Mr. Blackburn was going to take charge of a larger undertaking. They extended to him their best wishes, and hoped he would find his new position congenial. Alderman Smith said that Mr. Blackburn was the fifth young man who had gone from Keighley to more important positions. One former manager was in Africa, and the others at Portsmouth, Plymouth, and Southend. Mr. Blackman was subsequently presented by the chief officers of Keighley Corporation with a canteen of cutlery, and by the office staff and employees of the tramways with an inscribed barometer.

**Presentation to Mr. C. Owen Silvers.**—At a meeting of the Midland Municipal Tramways and Transport Association two armchairs were presented to Mr. C. Owen Silvers, general manager of Wolverhampton Corporation Tramways, who, after ten years' service, has relinquished the office of honorary secretary. Wolverhampton, Birmingham, Burton-on-Trent, Cardiff, Coventry, Derby, Gloucester, Leicester, Nottingham, Northampton, Walsall and West Bromwich tramways were represented. Mr. A. C. Baker, general manager of Birmingham Transport, who made the presentation, paid a generous tribute to the work of Mr. Silvers and his activities in Wolverhampton, where many deputations had inspected the trolleybus system. Mr. Silvers, replying, commented on some of the changes during the past ten years, and said that the Midland Association had contributed to the strong position held by municipal transport to-day.

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**Mr. John MacGregor,** late chairman of Johnson & Phillips, London, S.E., left estate valued at £30,744 gross and £22,236 net.

## CONTRACTS AND ORDERS.

**Edgar Allen & Co., Ltd.,** have an order from Liverpool Corporation for tramway trackwork at £880.

**Leeds Tramways Committee** accepted the tender of British Insulated Cables, Ltd., for three miles of trolley wire.

**Plymouth Corporation Tramways Committee** accepted the tender of Murex, Ltd., for the supply of welding plant at £250.

**Liverpool Tramways Committee** accepted the tender of British Insulated Cables, Ltd., for 5,000 35-in. and 200 65-in. copper bonds.

**The English Electric Co.** has a contract to supply switchgear to Barnsley Electricity Committee in connection with the grid scheme.

**Bradford Watch Committee** recommended the acceptance of the tender of Revo Electric Co., Ltd., for four sets of traffic signals at £600.

**Bristol Tramways and Carriage Co.** have purchased two miles of "Phono" electric trolley wire from the Equipment and Engineering Co., Ltd.

**Portsmouth Tramways Committee** accepted the tender of Samuel Salter (Portsmouth), Ltd., at £19,194, for the erection of administrative offices at Eastney.

**Bombay Electric Supply and Tramways Co.** have placed an order with the Equipment and Engineering Co., Ltd., for a "TA" type magnetic crack detector.

**East Suffolk County Council** accepted the tender of Siemens and General Electric Railway Signal Co. for five sets of automatic light control signals at £628.

**St. Helens Tramways Committee** recommended the acceptance of the tender of Ransomes, Sims & Jeffries, Ltd., Ipswich, for the supply of five double-deck trolleybuses.

**The Metropolitan Vickers Electrical Co.** is supplying four transformers and two 50,000 K.W. turbo-alternator sets for the Clarence Dock power station of Liverpool Corporation.

**Bradford Tramways Committee** recommended the tender of Mr. G. Charlesworth for making up uniforms for 1,412 men at £1,587, and for overcoats for 1,462 men at £1,061 10s.

**Liverpool Tramways Committee** has placed contracts as follow:—Edgar Allen & Co., special tramway trackwork; English Electric Co., 12 pairs of bogie trucks and 12 car sets of electro-pneumatic control gear.

**Nesta, Ltd.,** of Nesta Works, Brunswick Square, High Road, London, N.17, have an order for the seats for the upper and lower

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saloons of fifty of the cars that the Brush Electrical Engineering Co. are building for the Leeds Corporation.

**Marble Arch Station** of the Central London Railway is undergoing reconstruction by Mitchell Bros., Sons & Co. The work will occupy a year and a half, and will cost £92,000. Several other stations are to be reconstructed during the next few years.

**Glasgow Transport Committee** has accepted the following tenders: Copper Bonds—Thomas Bolton & Sons, Ltd.; Special Trackwork—Edgar Allen & Co., Ltd., Hadfields, Ltd., and Titan Trackwork Co., Ltd.; Band Saw Grazing Machine—T. White & Sons.

**Liverpool Tramways Committee** has accepted the tender of the English Electric Co., Ltd., for twelve pairs of equal wheel bogie trucks, with flexible driving shafts, each bogie fitted with one DK 120 motor (£1,700 per pair), and 12 car sets of electro-pneumatic control gear at £365 per car set.

**Glasgow Tramways Power Station.**—Glasgow Transport Committee recommended acceptance of the following tenders: General Electric Co., Ltd., exciter switchgear and altering switchgear for Pinkston power station; Harland Engineering Co., Ltd., the English Electric Co., Ltd., and Crompton, Parkinson, Ltd., for rotary converters and switchgear.

**The Ford Motor Co.** has placed an order with Crompton and Parkinson, Ltd., for 1,460 "KLOSD" A.C. motors for the equipment of the new works at Dagenham, Essex. This important order, which has been obtained in competition with other electrical motor makers in this country, is believed to be the largest ever placed for standard motors of one type. The motors will be delivered from the regular production schedule at Guiseley.

**Ferranti, Ltd.,** are constructing three 80,000 K.V.A. transformers for the Battersea station of the London Power Co., the largest units yet constructed in the country, if not in the world. The Central Electricity Board has placed the metering of the electricity passing between the grid and the local suppliers for the whole of South-East England in the hands of the company, and has ordered 76 per cent. of their largest transformers of 60,000 and 75,000 K.V.A. from the company.

**London County Council** has confirmed a contract with Sir William Arrol & Co., Ltd., for the maintenance of the temporary Waterloo Bridge and the support of the old bridge for a further period of one year from January 30, 1931. The Committee's report stated that the question of dealing with Waterloo Bridge is interlocked with that of a road bridge at Charing Cross. The submission to the Council of any further recommendations in regard to the reconditioning of Waterloo Bridge has accordingly been postponed.

**New Rolling Stock for the Metropolitan Railway.**—The Birmingham Railway Carriage and Wagon Co. are building 18 motor-coaches, 14 driving trailer coaches, 14 first-class coaches, and 19 third-class coaches for the Metropolitan Railway. The electrical equipment will be manufactured by the General Electric Co. There will be four motors to a coach, each of 275 H.P., and the control gear will be of the electro-pneumatic type. The coaches will have steel roofs and steel-sheeted sides with mouldings painted on. In other respects the new rolling stock will be similar to the latest rolling stock now in use by the company.

**The L.C.C. Highways Committee,** in their quarterly report for the three months ended September 30, mention that the following orders had been placed: English Steel Corporation, Ltd., 3,000 driving steel tyres and 3,000 pony wheel tyres; Equipment & Engineering Co., Ltd., 28 E.C.O. double-jet hot-air hand-dryers; David Brown and Sons (Hudd.), Ltd., 50 gear wheels, solid, for Class M.V.121 motors, and 50 gear wheels, solid, for Class M.V.128 and 124 motors; Metropolitan Vickers Electrical Co., Ltd., 50 gear wheels, solid, for Class D.K.31 C motors; F. W. Rowland & Co., 150 pinions, tie-bars; Bayliss, Jones & Bayliss, Ltd., 25,000 tie-bars slot to track rail, 1,500 tie-bars slot to yoke, and 7,500 tie-bars, flat.

**The English Electric Co.** is experiencing an increasing demand for Fullagar opposed-piston oil engine sets. The value of recent orders totals over £92,000, and no less than 42 per cent. of the total horse-power of Fullagar engines supplied by this company represents repeat orders. Recent contracts comprise: Karachi Electric Supply Corporation, 1,500 B.H.P. engine and tandem generators; the Admiralty, two 1,125 B.H.P. engines and 750 KW. D.C. generators; Delhi Electric Supply Co., 1,125 B.H.P. engine and 750 KW. A.C. generator; Dubbo (Australia), 750 B.H.P. engine and 500 KW. A.C. generator; Zanzibar (Crown Agents for the Colonies), 750 B.H.P. unit. Earlier in the year the following important orders, not included in the value given above, were received: Sudan Light & Power Co., 1,125 B.H.P. engine and alternator; Bermuda Electric Light, Power & Traction Co., Ltd., 1,500 B.H.P. engine and alternator. The manufacture of straight four-cycle Diesel engines, which has been carried on at the Rugby works of the company for the last twenty-three years, is still continued, and an order has recently been received from Colombo for a 335 B.H.P. unit, coupled to a 225-KW. generator.

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# TRAFFIC RETURNS.

## Tramway and Omnibus Undertakings in the United Kingdom.

| NAME OF COMPANY OR CORPORATION | 1929. WEEKS ENDING Oct. 12 | Oct. 19 | Oct. 26 | Nov. 2 | ... | 1930. WEEKS ENDING Oct. 11 | Oct. 18 | Oct. 25 | Nov. 1 | ... | AGGREGATE. Wks. | 1930 | Increase or Decrease. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Aberdeen Corporation ... ... ... | 4,542 | 4,332 | 4,358 | 4,674 | ... | 4,703 | 4,592 | 4,431 | 4,791 | ... | 22½ | 122,496 | + 2,375 |
| Ashton-under-Lyne Corporation ... ... | 1,700 | 1,690 | 1,671 | 1,637 | ... | 1,546 | 1,557 | 1,567 | 1,591 | ... | 31 | 49,832 | — 2,639 |
| Ayr Corporation ... ... ... ... | 469 | 464 | 430 | 437 | ... | 430 | 434 | 414 | 412 | ... | 24 | 15,761 | — 1,249 |
| Barrow Corporation ... ... ... | 865 | 868 | 851 | 863 | ... | 916 | 927 | 932 | 911 | ... | 31 | 31,043 | — 467 |
| Belfast City ... ... ... ... | 12,408 | 12,419 | 12,272 | 12,195 | ... | 12,929 | 13,139 | 12,953 | 12,883 | ... | 30½ | 392,932 | + 18,985 |
| Birkenhead Corporation ... ... ... | 4,993 | 4,824 | 4,788 | 4,663 | ... | 5,473 | 5,262 | 5,130 | 5,118 | ... | 31 | 164,775 | — 3,630 |
| Birmingham Corporation ... ... ... | 41,875 | 42,098 | 41,586 | ... | ... | 43,065 | 43,757 | 42,916 | ... | ... | 30 | 1,269,113 | + 43,978 |
| Blackburn Corporation ... ... ... | 1,902 | 1,861 | 1,816 | 1,803 | ... | 2,091 | 2,041 | 2,078 | 2,050 | ... | 30½ | 65,092 | + 4,659 |
| Bradford Corporation ... ... ... | 15,873 | 14,932 | 15,292 | 14,807 | ... | 15,713 | 14,369 | 15,163 | 14,476 | ... | 31 | 443,397 | — 17,731 |
| Brighton Corporation ... ... ... | 2,579 | 2,346 | 2,313 | 2,288 | ... | 2,375 | 2,396 | 2,242 | 2,198 | ... | 30½ | 88,219 | + 1,701 |
| Burnley Corporation ... ... ... | 3,693 | 3,645 | 3,567 | 3,560 | ... | 3,529 | 3,411 | 3,342 | 3,487 | ... | ... | ... | ... |
| Burton-on-Trent Corporation ... ... | 819 | 824 | ... | ... | ... | 929 | 891 | ... | ... | ... | 29 | 23,948 | + 943 |
| Bury Corporation ... ... ... ... | 2,760 | 2,644 | 2,652 | 2,658 | ... | 3,001 | 3,023 | 3,030 | 3,049 | ... | 30½ | 91,675 | + 13,248 |
| Cardiff Corporation ... ... ... | 7,605 | 7,516 | 7,476 | 7,661 | ... | 7,741 | 7,720 | 7,691 | 7,713 | ... | 30½ | 240,985 | + 2,180 |
| Chester Corporation ... ... ... | 430 | 414 | 410 | 406 | ... | 671 | 660 | 672 | 667 | ... | 31 | 20,780 | + 7,081 |
| Chesterfield Corporation ... ... ... | 2,070 | 2,014 | 1,979 | 1,962 | ... | 2,026 | 2,012 | 2,030 | 1,995 | ... | 31 | 60,254 | + 1,076 |
| Colchester Corporation ... ... ... | 562 | 524 | 526 | 547 | ... | 604 | 586 | 587 | 561 | ... | 32 | 19,598 | + 1,956 |
| Colne Corporation ... ... ... | 704 | 674 | 667 | 635 | ... | 697 | 708 | 703 | 648 | ... | 31 | 22,068 | — 387 |
| Coventry Corporation ... ... ... | 3,868 | 3,802 | 3,898 | 3,918 | ... | 3,661 | 3,369 | 3,404 | 3,618 | ... | 31 | 115,696 | + 195 |
| Darlington Corporation ... ... ... | 999 | 992 | 984 | 1,010 | ... | 1,021 | 1,064 | 1,032 | 1,027 | ... | 30½ | 32,711 | + 2,466 |
| Derby Corporation ... ... ... | 3,292 | 3,354 | 3,268 | 3,265 | ... | 3,403 | 3,360 | 3,356 | 3,286 | ... | 31 | 104,142 | + 3,189 |
| Dover Corporation ... ... ... | 377 | 384 | 362 | 356 | ... | 407 | 401 | 387 | 375 | ... | 31 | 13,803 | + 466 |
| Dundee City ... ... ... ... | 3,440 | 3,441 | 3,450 | 3,447 | ... | 3,808 | 3,679 | 3,809 | 3,705 | ... | 23½ | 87,971 | + 4,980 |
| East Ham Corporation ... ... ... | 2,481 | 2,356 | 2,299 | 2,370 | ... | 2,387 | 2,307 | 2,218 | 2,210 | ... | 30½ | 70,445 | + 41 |
| Edinburgh Corporation ... ... ... | 17,808 | 17,791 | 17,725 | 17,721 | ... | 18,143 | 18,490 | 18,181 | 18,032 | ... | 24½ | 457,919 | + 13,287 |
| Exeter Corporation ... ... ... | 1,105 | 1,008 | 1,022 | 1,011 | ... | 1,188 | 1,170 | 1,116 | 1,145 | ... | 32 | 36,440 | + 3,601 |
| Glasgow Corporation ... ... ... | 53,787 | 53,754 | 52,480 | ... | ... | 55,469 | 55,941 | 54,848 | ... | ... | 21 | 1,095,255 | + 61,708 |
| Gloucester Corporation ... ... ... | 660 | 625 | 597 | 627 | ... | 802 | 715 | 723 | 686 | ... | 30½ | 21,936 | + 4,234 |
| Grimsby Corporation ... ... ... | 1,431 | 1,403 | 1,452 | 1,397 | ... | 1,581 | 1,588 | 1,548 | 1,567 | ... | 31 | 49,841 | + 5,059 |
| Halifax Corporation ... ... ... | 4,667 | 4,605 | 4,653 | 4,563 | ... | 5,182 | 5,173 | 5,120 | 5,210 | ... | 31½ | 161,838 | + 17,512 |
| Huddersfield Corporation ... ... | 6,554 | 6,319 | 6,352 | 6,435 | ... | 6,561 | 6,428 | 6,409 | 6,428 | ... | 31 | 198,386 | — 1,862 |
| Hull Corporation ... ... ... ... | 9,777 | 9,910 | 7,589 | 7,675 | ... | 8,125 | 9,486 | 7,444 | 7,522 | ... | 31 | 228,275 | — 33 |
| Ilford Corporation ... ... ... ... | 1,561 | 1,508 | 1,492 | 1,511 | ... | 1,544 | 1,558 | 1,536 | 1,530 | ... | 30½ | 46,758 | + 623 |
| Ipswich Corporation Trolley Buses ... | 1,296 | 1,287 | 1,269 | 1,318 | ... | 1,344 | 1,376 | 1,348 | 1,373 | ... | 30½ | 42,217 | + 2,263 |
| Isle of Thanet ... ... ... ... | 544 | 518 | 463 | 406 | ... | 519 | 459 | 442 | 386 | ... | 43½ | 38,820 | — 4,526 |
| Kilmarnock Corporation ... ... ... | 490 | 470 | 496 | 487 | ... | 514 | 527 | 520 | 511 | ... | 24½ | 12,111 | + 538 |
| Leeds Corporation ... ... ... ... | 19,684 | 19,852 | 19,562 | 19,649 | ... | 19,923 | 19,902 | 20,394 | 19,989 | ... | 30½ | 615,754 | + 10,040 |
| Leicester Corporation ... ... ... | 8,789 | 8,636 | 8,613 | 8,595 | ... | 8,631 | 8,568 | 8,572 | 8,674 | ... | 31 | 259,264 | — 63 |
| Lincoln Corporation Buses ... ... | 921 | 840 | 872 | 899 | ... | 919 | 893 | 904 | 857 | ... | 31 | 29,316 | + 220 |
| Liverpool Corporation ... ... ... | 30,022 | 30,395 | 29,614 | 30,011 | ... | 29,912 | 29,931 | 29,790 | 29,650 | ... | 30½ | 928,601 | — 19 |
| London County Council ... ... ... | 84,973 | 84,800 | 83,731 | 84,614 | ... | 84,406 | 83,964 | 84,091 | 82,872 | ... | 30½ | 2,508,697 | — 23,072 |
| Luton Corporation ... ... ... | 406 | 411 | 394 | 389 | ... | 421 | 396 | 408 | 385 | ... | 30½ | 13,002 | + 280 |
| Maidstone Corporation ... ... ... | 849 | 819 | 756 | 764 | ... | 951 | 842 | 847 | 800 | ... | 30½ | 27,516 | + 1,918 |
| Manchester Corporation ... ... ... | 40,363 | 40,626 | 39,923 | 40,030 | ... | 41,600 | 41,895 | 41,290 | 41,636 | ... | 31 | 1,261,310 | + 25,130 |
| Middlesbrough Corporation ... ... | 1,707 | 1,608 | 1,605 | 1,693 | ... | 1,560 | 1,603 | 1,486 | 1,605 | ... | 31½ | 49,896 | — 2,288 |
| Newcastle-on-Tyne Corporation ... | 12,216 | 12,211 | 13,024 | 11,258 | ... | 11,893 | 11,978 | 12,362 | 11,945 | ... | 30½ | 365,520 | — 9,764 |
| Newport Corporation ... ... ... | 2,444 | 2,372 | 2,353 | ... | ... | 2,570 | 2,465 | 2,394 | ... | ... | 30 | 72,700 | — 15 |
| Northampton Corporation ... ... | 1,780 | 1,813 | 1,803 | 1,754 | ... | 1,901 | 1,807 | 1,800 | 1,828 | ... | 30½ | 56,237 | + 1,369 |
| Nottingham Corporation ... ... | 11,338 | 10,037 | 9,604 | 9,736 | ... | 12,330 | 10,633 | 10,696 | 10,495 | ... | 30½ | 317,185 | + 23,539 |
| Oldham Corporation ... ... ... | 5,628 | 5,585 | 5,503 | 5,585 | ... | 5,361 | 5,274 | 5,295 | 5,316 | ... | 32 | 170,320 | — 8,117 |
| Plymouth Corporation ... ... ... | 5,740 | 5,745 | 5,520 | 5,549 | ... | 6,082 | 5,947 | 6,052 | 5,881 | ... | 30½ | 191,071 | + 11,558 |
| Portsmouth Corporation ... ... ... | 5,648 | 5,776 | 5,286 | 5,451 | ... | 6,602 | 6,429 | 6,239 | 6,076 | ... | 31 | 240,951 | + 28,083 |
| Preston Corporation ... ... ... | 2,303 | 2,268 | 2,186 | 2,174 | ... | 2,270 | 2,302 | 2,253 | 2,149 | ... | 30½ | 66,814 | — 1,372 |
| Rawtenstall Corporation ... ... ... | 1,374 | 1,360 | 1,356 | 1,370 | ... | 1,346 | 1,341 | 1,377 | 1,382 | ... | 30½ | 41,638 | — 661 |
| Reading Corporation ... ... ... | 2,541 | 2,432 | 2,411 | 2,422 | ... | 2,527 | 2,477 | 2,502 | 2,446 | ... | 31 | 75,571 | + 689 |
| Rochdale Corporation ... ... ... | 4,396 | 4,389 | 4,367 | 4,347 | ... | 4,378 | 4,367 | 4,437 | 4,459 | ... | ... | 133,654 | — 5,644 |
| Rotherham Corporation ... ... ... | 2,752 | 2,667 | 2,990 | 2,768 | ... | 2,725 | 2,813 | 2,917 | 3,022 | ... | 31 | 86,762 | + 2,283 |
| Salford Corporation ... ... ... | 11,409 | 11,304 | 11,332 | 11,468 | ... | 11,101 | 11,438 | 11,168 | 11,114 | ... | 30½ | 344,475 | — 1,803 |
| Sheffield Corporation ... ... ... | 21,191 | 21,317 | 20,820 | 21,245 | ... | 20,065 | 20,290 | 20,501 | 20,150 | ... | 29½ | 629,567 | — 21,661 |
| Southampton Corporation ... ... | 4,258 | 4,256 | 4,028 | 4,179 | ... | 4,534 | 4,429 | 4,360 | 4,188 | ... | 31 | 134,713 | + 5,037 |
| Southend-on-Sea Corporation ... ... | 2,162 | 2,051 | 2,017 | 2,026 | ... | 2,102 | 2,145 | 2,047 | 1,997 | ... | 31½ | 82,175 | — 389 |
| Southport Corporation ... ... ... | 1,581 | 1,533 | 1,489 | 1,515 | ... | 1,643 | 1,638 | 1,590 | 1,589 | ... | 30½ | 56,347 | + 556 |
| St. Helens Corporation ... ... ... | 1,984 | 2,037 | 1,964 | 2,053 | ... | 2,090 | 2,025 | 2,029 | 2,128 | ... | 30½ | 62,030 | + 2,980 |
| Sunderland Corporation ... ... ... | 2,562 | 2,614 | 2,584 | 2,618 | ... | 2,881 | 2,835 | 2,787 | 2,840 | ... | 31 | 95,584 | + 11,400 |
| Swindon Corporation ... ... ... | 844 | 831 | 779 | 821 | ... | 1,009 | 991 | 958 | 963 | ... | 30½ | 30,194 | + 5,709 |
| Wallasey Corporation ... ... ... | 3,003 | 3,157 | 2,925 | 3,051 | ... | 3,245 | 3,259 | 3,122 | 3,218 | ... | 30½ | 112,908 | + 3,767 |
| Walsall Corporation ... ... ... | 3,518 | 3,494 | 3,435 | 3,418 | ... | 3,786 | 3,814 | 3,863 | 3,952 | ... | 31 | 109,007 | + 2,944 |
| Walthamstow Corporation ... ... | 2,538 | 2,445 | 2,397 | 2,436 | ... | 2,448 | 2,461 | 2,433 | 2,438 | ... | 30½ | 76,443 | — 460 |
| Warrington Corporation ... ... ... | 1,408 | 1,373 | 1,366 | 1,351 | ... | 1,480 | 1,414 | 1,431 | 1,448 | ... | 31 | 43,185 | + 1,944 |
| West Ham Corporation ... ... ... | 6,418 | 6,320 | 6,129 | 6,275 | ... | 6,142 | 6,091 | 6,067 | 5,959 | ... | 30½ | 184,104 | — 1,091 |
| Wolverhampton Corporation ... ... | 6,215 | 6,120 | 6,149 | 6,097 | ... | 5,920 | 6,068 | 5,960 | 5,961 | ... | 31 | 184,130 | — 6,878 |
| York Corporation ... ... ... | 1,532 | 1,449 | 1,513 | 1,512 | ... | 1,492 | 1,493 | 1,428 | 1,555 | ... | 32 | 49,635 | + 1,439 |

## Underground Electric Railways Company of London, Limited.

| NAME OF COMPANY | 1929. WEEKS ENDING Oct. 12 | Oct. 19 | Oct. 26 | Nov. 2 | ... | 1930. WEEKS ENDING Oct. 11 | Oct. 18 | Oct. 25 | Nov. 1 | ... | AGGREGATE. Wks. | 1930 | Increase or Decrease |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Underground Co. (Common Fund Co.) ... | 293,400 | 297,600 | 291,600 | 290,600 | ... | 310,400 | 312,400 | 309,600 | 305,600 | ... | 44 | 13,278,900 | + 692,600 |
| London and Suburban District ... ... | 44,000 | 44,500 | 42,900 | 42,800 | ... | 45,800 | 46,600 | 45,500 | 44,800 | ... | 44 | 1,956,400 | + 108,200 |

## Colonial and Foreign Tramway Traffic Returns.

| NAME OF COMPANY OR CORPORATION | 1929. WEEKS ENDING Oct. 12 | Oct. 19 | Oct. 26 | Nov. 2 | ... | 1930. WEEKS ENDING Oct. 11 | Oct. 18 | Oct. 25 | Nov. 1 | ... | AGGREGATE. Wks. | 1930 | Increase or Decrease |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Anglo-Argentine ... ... ... ... | 86,695 | 87,614 | 87,075 | 86,751 | ... | 81,793 | 80,696 | 79,967 | 82,019 | ... | 44 | 3,601,726 | — 193,550 |
| Buenos Aires Lacroze ... ... ... | 11,798 | 11,716 | 12,019 | 12,637 | ... | 11,611 | 11,349 | 11,786 | 12,659 | ... | 18 | 197,516 | — 12,380 |
| Calcutta ... ... ... *Rupees* | 132,577 | 110,754 | 115,229 | 111,664 | ... | 91,262 | 94,215 | 96,703 | 98,271 | ... | 43½ | 4,797,321 | — 723,006 |
| Madras (2 weeks) ... ... *Rupees* | ... | 46,623 | ... | 41,430 | ... | ... | 50,006 | ... | 41,082 | ... | 42 | 927,614 | + 48,878 |

| | 1929. May | June | July | Aug. | Sept. | Oct. | 1930. May | June | July | Aug. | Sept. | Oct. | AGGREGATE. Mths. | 1930 | Increase or Decrease |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Brazilian Trac. $ | 4,206,895 | 4,210,893 | 4,335,895 | 4,333,460 | 4,225,416 | 1,289,258 | 4,304,160 | 4,146,884 | 4,081,018 | 3,792,808 | 3,906,162 | ... | 9 | 36,066,347 | — 865,449 |
| British Columbia $ | 1,165,279 | 1,133,017 | 1,156,720 | 1,168,753 | 1,169,278 | 1,230,278 | 1,203,292 | 1,144,585 | 1,196,239 | 1,194,390 | 1,206,579 | ... | 3 | 3,597,208 | + 102,457 |
| Burma ... Rs. | 66,077 | 63,157 | 64,649 | 61,309 | 59,467 | 66,885 | 66,320 | 66,317 | 66,444 | 66,418 | 65,852 | ... | 2 | 132,270 | + 11,494 |
| Cape Town ... | 29,366 | 27,995 | 27,779 | 27,636 | 26,579 | 27,501 | 27,286 | 25,525 | 24,953 | 24,690 | 24,295 | ... | ... | ... | ... |
| Carthagena & H. ... | 725 | 1,476 | 1,100 | 1,169 | 660 | 1,953 | 552 | 515 | 738 | 505 | 437 | 559 | 10 | 7,851 | — 2,852 |
| Durban ... ... | 24,518 | 24,308 | 29,110 | 25,619 | 22,371 | ... | 23,945 | 23,440 | 27,049 | 25,071 | 21,156 | ... | 2 | 46,227 | — 1,763 |
| East India ... | 3,862 | 3,772 | 3,801 | 4,152 | 4,126 | 4,078 | 3,698 | 3,803 | 3,833 | 3,948 | 3,731 | 3,809 | 3 | 11,488 | — 868 |
| Kalgoorlie ... ... | 1,747 | 1,660 | 1,664 | ... | ... | ... | 1,815 | 1,753 | 1,776 | ... | ... | ... | 7 | 11,662 | + 137 |
| Para ... ... | 15,182 | 15,450 | 15,044 | 15,224 | 15,200 | 17,887 | 15,568 | 15,028 | 14,816 | 12,681 | 12,196 | ... | 10 | 143,500 | — 5,026 |
| Port Elizabeth ... | 7,601 | 7,335 | 7,503 | 7,402 | 7,190 | 7,793 | 7,552 | 6,951 | 7,045 | 6,955 | 6,670 | ... | ... | ... | ... |
| Rangoon ... Rs. | 121,040 | 114,535 | 122,630 | 123,550 | 122,850 | 132,742 | 149,440 | 142,170 | 151,300 | 146,320 | 147,775 | ... | 9 | 1,345,030 | + 267,189 |
| Shanghai ... $ | 339,833 | 335,740 | 329,139 | 335,172 | 365,828 | 371,611 | 183,409 | 367,231 | ... | 386,112 | 418,059 | ... | 9 | 3,097,758 | + 101,709 |
| Singapore ... $ | 133,000 | 123,000 | 131,000 | 130,000 | 126,000 | 133,000 | 148,000 | 140,000 | 145,000 | 142,000 | 140,000 | ... | 12 | 1,650,000 | + 179,000 |
| Winnipeg ... $ | 534,954 | 517,738 | 497,935 | 494,642 | 518,521 | 545,308 | 509,709 | 479,958 | 452,212 | 445,908 | 484,609 | ... | 9 | 4,656,233 | — 194,943 |

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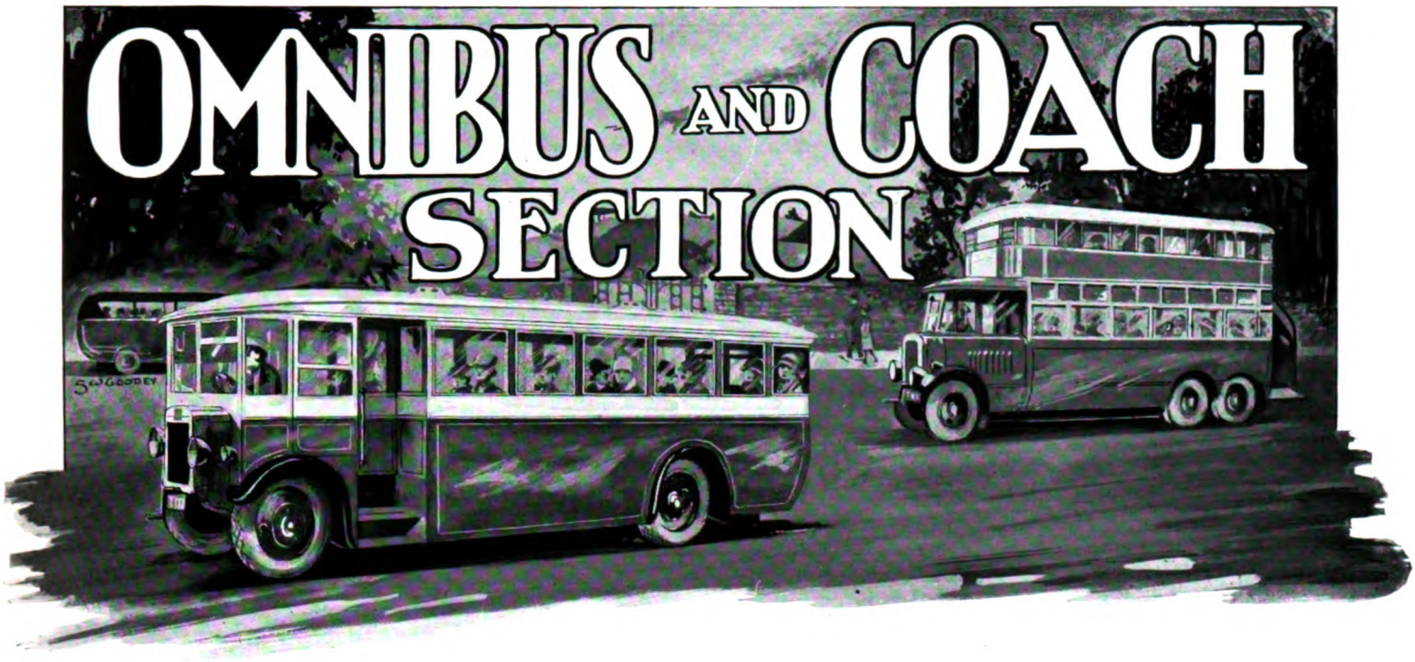


**OMNIBUS AND COACH SECTION—TWENTY-FIFTH YEAR OF PUBLICATION.**

### GOODS HAULAGE AND STATE REGULATION.

In their next report the Royal Commission on Transport will announce their recommendation as to whether goods hauliers on the road should come under State regulation. If at this juncture they need aid in helping them to arrive at a decision, they will find the strongest possible arguments on the negative side in the statement of reasons why the Great Western Railway is to expend £89,786 on the purchase of 152 additional motor vehicles for use in railroad services. The statement, too, serves to emphasise the reasons for the sympathy extended by the Hon. Sir Arthur Stanley to those hauliers who are opposed to regulation. Sir Arthur's remarks were made in the course of his address as the new President of the Institute of Transport, and were the result of his weighing the arguments for and against. Responsible members of the industry have advocated regulation by the traffic commissioners because of the tendency of "owner-driver" undertakings to quote unsound rates and because of the action of certain clearing houses. On the other hand old-established undertakings deprecate the irksome restriction of State regulation. They prefer to carry on business in their own way and to make arrangements for co-operation with the railways. These operators are of the opinion that the drawbacks already mentioned will in due course adjust themselves to economic requirements. Instancing how quick decisions are often necessary, Sir Arthur Stanley was dubious as to the conduct of urgent business under officialdom. His justification is to be found in the very wide extensions of the co-ordinated services which the G.W.R. is now making, as set forth in another column.

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### SAFETY OF COACH PASSENGERS.

If the motor coach is to retain its popularity every effort will have to be made to ensure the safety of its patrons. The frequency of serious accidents which have happened recently, is bound to have an effect upon the thinking traveller who, without being unduly nervous, is certain to regard reasonable safety as essential. The term "safety coach," which was considered of value by the pioneers of the modern motor coach services as an inducement for patronage, is little used to-day for the reason that the majority of the coaches now in use are so constructed that, given good roads, comparatively high speeds can be maintained for considerable periods with a wide margin of safety. Indeed it is not too much to say that the improvements which have now been incorporated in many makes of this type of vehicle, both with regard to the chassis and body, is the outstanding feature in the development of passenger road transport. Unfortunately, however perfect the machine may be, we have the human element to contend with immediately it takes its place on the road, and as the "other fellow" has always to be considered it necessarily follows that the driver of the coach with its human load has a heavy responsibility which demands the utmost skill and the greatest possible care if accidents are to be avoided. Speaking generally we are confident that the great majority of these drivers invariably give of their best for the safe conduct of their charges, and therefore in their interest as well as for the safety of the travelling public the dangerous driver must be eliminated. When the new Road Traffic Act comes into force there will be ample power for dealing with these delinquents, for although the question of speed alone will cease to have the importance it has had hitherto, cases of careless and dangerous driving will, we hope, be severely dealt with. In this connection the recent decision of the Kingston County justices is to be commended on the lines that "prevention is better than cure." In this case a driver who had been convicted on five previous occasions, admitted that he had again exceeded the speed limit and it was stated that he had driven a fully-loaded motor coach at a speed of 43 miles per hour. The justices decided not to impose any further fines but to suspend the man's licence for three months. A rigorous following of this course would soon have a marked effect upon the

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# OMNIBUS AND COACH SECTION

frequency of avoidable accidents and do much to restore the confidence of the travelling public.

### THE HIGH-SPEED OIL ENGINE.

On other pages of this issue are articles descriptive of the progress achieved by two leading traction engineering companies in the construction of a high-speed oil engine for road work. In each instance a new and successful design has been introduced from the Acro system as its basis. Messrs. Aveling & Porter have for their first model a four-cylinder engine, but their enterprise is not expected to stop short at that stage, in view of six cylinders having become almost normal for new omnibus traffic. The other inventors are the Associated Equipment Co., who offer a six-cylinder machine for both passenger and goods. The companies deserve congratulations upon their achievements. Messrs. Aveling & Porter successfully subjected their original model to the rough and severe trial of the International ploughing tests, while the A.E.C. model has scored in passenger and commercial traffic, the latter on roads providing an all-round test of the cost of operation as compared with a petrol engine used in the same chassis and body. Averaging the results it is found that the oil engine gave an average consumption of 9.7 m.p.g. as against 5 m.p.g. for the petrol engine. The monetary saving may be further gauged by stating that for an average load, which may be regarded as about 40 per cent. of full load, the consumption for the oil engine is about 60 per cent. of that of the petrol engine. The economical aspect was dealt with by Mr. Vane Morland in his paper published in our issue of October 16, in which he referred not only to his work with the Gardner engine at Walsall but to other trials, including the experience of the A.E.C. with their engine. In the present issue that experience is fully set forth, and taken in conjunction with that of Aveling & Porter, Ltd., there is every reason for predicting that the high-speed oil engine has an assured future. Already Leeds Transport Department is to introduce further Gardner-Crossley vehicles, and Manchester is to be the scene of an important experiment, while the L.G.O.C. are introducing the A.E.C. engine in the Metropolis.

### OMNIBUS STATIONS.

The need for providing omnibus stations was mentioned by several speakers at the conference of the Municipal Tramways and Transport Association. This need is the outcome of the growth not only of local traffic but of long-distance services, passenger and goods, all running to their own times. Several considerations will influence whatever decisions are arrived at. A central station may be feasible in some towns; in others district stations would be advantageous. In all cases it would seem to be desirable to keep the station separate from a parking place for cars. Lack of room in the station will in most instances enforce that course. By-laws for the control of omnibus and other traffic will be found to facilitate dealing with the problem, but care should be taken to frame them only after consultation with the interests involved. The matters dealt with may have to comprise routes to be followed, one-way streets, and the spot where an omnibus is to stand if not returning at once to its destination. Still more important is the question whether omnibus and coach traffic is to be in any way restricted in the central area. Such a regulation has just come into force in the Potteries, whereby no promiscuous stopping places are allowed within a radius of 500 yards of the centre of each of the six Pottery towns. Omnibuses are permitted to pick up and set down only at specified points within those areas. In towns which have accessible railway stations with spacious forecourts it may be possible to locate omnibus stations there, especially if a local authority or a company is working in co-ordination with the railway. A good example of an omnibus station thus situated is at the Victoria terminus of the Southern Railway in London.

### AIR TYRES TO BE COMPULSORY.

In the first instance the tyre manufacturers are chiefly concerned with the decision of the Minister of Transport to make compulsory the use of pneumatic tyres on vehicles of reasonable weight and dimensions. As a guide to what is reasonable it is of interest to note that 12-ton steam wagons are now to be found on pneumatics. Exemption is proposed for existing vehicles and for those registered within a year of the making of the regulations. So far there has been no publication of the views entertained by the tyre and vehicle makers. The reason is doubtless to be found in the fact that the Ministry of Transport marked the communication containing this and other proposals "Confidential." The only enlightenment comes from the C.M.U.A., who announce that they have not yet come to a conclusion that the regulation should be so widely drawn. Neither on this nor any other matter should there be a suspicion of secrecy, for there are thousands of commercial motor users unconnected with any organisation. There is, however, one safeguard for both organised and unorganised users in that the regulations are not to be permanent. The Minister recognises that regulations must from time to time be altered to keep in line with an industry that does not stand still. So far as public passenger transport is concerned the air-tyre requirement is but a message to the converted. Outside of London solids are a rarity; in the Metropolitan area no omnibuses can now be presented for re-licensing unless they are on pneumatics. In the case of both passenger and goods vehicles the change-over was assisted by the last Chancellor of the Exchequer's reduction of the tax on vehicles of two tons and upwards. The concession is an official recognition of the fact that less damage is done to roads by the air tyre. That and several other factors constitute the hall-mark of efficiency. A vehicle that runs on rubber and air does not arouse the hostility of residents in adjoining houses in which damage is inflicted by vibration and nerves injured by noise. Its cost of maintenance is also reduced, the running charges are less, and nearly double the amount of delivery work can be done in a day.

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# OMNIBUS AND COACH SECTION

### WHEN THE NEW ACT WILL OPERATE.

Within a week or two the first instalment of the Road Traffic Act will be in operation and active preparations are being made for carrying out the provisions of this and the subsequent sections which will follow at intervals. One advantage of this division of dates is that those affected will be able to make themselves better acquainted with the multifarious provisions of the Act. On December 1 Part I will be enforced. This deals with the regulation of motor vehicles, and includes the conditions for the granting of driving licences. The declaration which applicants have to sign has been simplified. They must be able to declare that they can read at a distance of 25 yards in good daylight (with glasses if worn) a motor car plate containing six letters and figures. Anyone who cannot comply with this condition is certainly not fit to drive a motor vehicle. Applicants must also be free from epilepsy or liability to sudden attacks of disabling giddiness or fainting. Part II, providing for insurance against third-party risks, will operate as from January 1, the questions affecting this section having been settled with the insurance companies. Under Part III a Highway Code is being prepared and this also is provisionally fixed to start on January 1. The Code, when ready, will be sold at a penny per copy. It may be noted that failure to observe any provision of the Code does not in itself render the offender liable to prosecution, but in any subsequent proceedings this failure could be used by any party to the proceedings to establish a negative liability. Part IV, dealing with the regulation of public service vehicles, will not become operative until April 1. This part of the Act creates the eleven traffic areas, including one for London, eight in England and two in Scotland, with Commissioners who will issue licences and have power to co-ordinate road services. It is expected that by the end of November the Commissioners will have been appointed and their names published. All public service vehicles must be examined before April 1 and receive a certificate of fitness, and must be licensed before they can be used after that date. On April 1 also Part V, which enables municipalities to run omnibus services without applying to Parliament for permission, will come into operation. Such municipalities must of course obtain the consent of the Traffic Commissioners. The Act itself is a voluminous document, and with the regulations to be issued will involve much study by operators for some time, but as it repeals thirty-two previous enactments it should prove much simpler than the laws and regulations hitherto in force which have led to the chaotic conditions now prevailing.

### MUNICIPAL OMNIBUS RECORDS.

We publish elsewhere in this issue a table of statistics relating to municipal omnibus operation during the last financial year. These figures are not in all cases complete because certain municipalities for reasons of policy at present prefer not to publish full details of omnibus working. Moreover, until the standard system of accounting recommended by the Municipal Tramways and Transport Association is adopted by all municipal transport undertakings an exact analysis of results must necessarily be impossible. Many corporations continue to combine the net revenue and capital accounts of both tramway and omnibus departments, while even those that maintain separate accounts have in very few cases attempted to apportion accurately the capital expenditure between the two branches. For the most part omnibuses make use of tramway capital in the shape of land, car-sheds and administrative offices, but all that has been debited to the omnibus capital account is the first cost of the omnibuses. In other cases omnibuses have been purchased out of tramway-revenue, and we have the unusual spectacle of a concern returning a gross profit not far short of its total capital. In yet other cases where the capital appears to be out of all proportion to the turnover it will be found that the tramways have been abandoned, and the outstanding debt has been taken over by the omnibuses. Besides these anomalies there are certain apparent peculiarities due to the fact that some authorities have only recently adopted petrol omnibuses or have considerably augmented their fleets during the year, thus giving a relatively low figure for the number of omnibuses in daily use as compared with the number in stock. It is, of course, impracticable to enumerate here all the special circumstances connected with each undertaking; but the figures set out in the table will give a good general idea of the results that are now being obtained throughout the country. The columns which will attract special attention will doubtless be those relating to operating expenses per omnibus mile. Here again caution must be employed in drawing conclusions, since the total mileage and the average speed, both of which vary to a much greater extent than the corresponding figures for tramways, have a direct bearing on the figures. The records set out, however, in tabloid form just those essential financial and operative details constantly asked for by operators. We present them in the hope that they will prove of service and that the discussion and criticism to which they will inevitably give rise will hasten the time when thoroughly comparable statistics will be annually obtainable. The magnitude of the municipal omnibus industry, evidenced by the considerable total of seven hundred and fifty million passengers carried last year and over four thousand vehicles operated, makes the adequacy of statistical information of immense value.

## THE SCOTTISH MOTOR EXHIBITION

New Models for Passenger Services.

The 29th Scottish Motor Exhibition was opened in Kelvin Hall, Glasgow, on November 7, and remains open until November 15. The exhibition includes both pleasure cars and commercial vehicles. As there is no commercial vehicle exhibition in London this year, special interest attaches to the heavy vehicle section at Glasgow. All the commercial exhibits are in one section of the exhibition, on stands numbered from 102 to 146.

An illustrated report of the Exhibition will be given in a later issue.

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# MUNICIPAL OMNIBUS RECORDS

| NAME | Year Ended | Total Capital Outlay to date | Total Income | Total Operating Expenses | Percentage of Operating Expenses to Receipts | Gross Profit | Net Surplus or Deficit | Provision for Renewals | Total Bus Miles Run | Average Revenue per Bus Mile | | Average Fare Paid per Passenger |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | % | £ | £ | £ | | Total d. | Traffic d. | d. |
| Aberdeen .. .. | May 31, 1930 | 52,456 | 90,671 | 72,700 | 80·18 | 17,971 | 10,578 | 8,578 | 2,026,978 | 10·73 | 10·33 | 1·2 |
| Accrington .. | Mar. 31, 1930 | 17,637 | 11,581 | 7,178 | — | 4,403 | 2,632 | — | — | — | — | 2·27 |
| Ashton-U.-L. .. | Mar. 31, 1930 | 19,773 | 25,325 | 19,991 | 69·75 | 5,334 | 2,186 | — | 428,788 | 14·175 | 14·052 | 1·41 |
| Barrow .. .. | Mar. 31, 1930 | 12,873 | 20,308 | 18,526 | 91·0 | 1,782 | — 598 | 1,131 | 530,494 | 8·98 | 8·92 | 1·46 |
| Belfast .. .. | Mar. 31, 1930 | 59,697 | 59,860 | 65,197 | 108·92 | — 5,337 | — 20,714 | 887 | 1,612,210 | 8·91 | 8·78 | 1·88 |
| Birkenhead .. | Mar. 31, 1930 | 160,884 | 181,385 | 116,669 | 64·29 | 64,716 | 25,000 | — | 2,649,644 | 16·427 | 16·334 | 1·955 |
| Birmingham .. | Mar. 31, 1930 | 865,383 | 729,719 | 547,969 | 75·10 | 181,730 | 169,851 | — | 10,422,134 | 16·804 | 16·498 | 1·709 |
| Blackburn .. | Mar. 31, 1930 | 18,315 | 7,769 | 8,257 | 115·33 | — 488 | — 1,855 | — | 132,147 | 13·10 | 12·95 | 1·96 |
| Blackpool .. .. | Mar. 31, 1930 | 80,500 | 67,037 | 68,237 | 101·79 | — 1,200 | — 16,883 | — | 1,641,288 | 9·80 | 9·80 | 1·77 |
| Bolton .. .. | Mar. 31, 1930 | 124,689 | 88,883 | 64,558 | 72·62 | 24,325 | — 6,868 | — | — | — | — | — |
| Bournemouth .. | Mar. 31, 1930 | 30,860 | 22,802 | 23,352 | 102·41 | — 550 | — 4,385 | — | 478,837 | 11·43 | 11·36 | 1·45 |
| Bradford .. .. | Mar. 31, 1930 | 133,108 | 165,994 | 148,580 | 89·51 | 17,414 | — 13,942 | — | — | — | — | — |
| Burnley .. .. | Mar. 31, 1930 | 27,538 | 33,743 | 36,900 | 109·4 | — 3,157 | — 6,376 | — | 1,039,865 | 7·788 | 7·788 | 1·42 |
| Burton .. .. | Mar. 31, 1930 | 57,431 | 30,431 | 24,249 | 79·7 | 6,182 | 1,289 | — | 685,886 | 10·65 | 10·56 | 1·806 |
| Bury .. .. | Mar. 31, 1930 | 29,995 | 34,037 | 24,258 | 72·06 | 9,779 | 4,895 | 1,263 | 694,050 | 11·769 | 11·660 | 2·10 |
| Cardiff .. .. | Mar. 31, 1930 | 147,616 | 156,640 | 143,255 | 91·45 | 13,385 | — 4,871 | — | 2,938,165 | 12·79 | 12·63 | 3·053 |
| Chester .. .. | Mar. 31, 1930 | 22,414 | 3,749 | 3,463 | 92·0 | 286 | 28 | — | 71,400 | 12·60 | 12·60 | 1·26 |
| Chesterfield .. | Mar. 31, 1930 | 98,081 | 71,166 | 78,170 | 86·0 | 9,754 | — 7,003 | — | 1,449,900 | 13·39 | 11·57 | 2·24 |
| Colchester .. | Mar. 31, 1930 | 25,602 | 25,767 | 20,060 | 77·85 | 5,707 | 2,097 | — | 487,094 | 12·69 | 12·33 | 1·72 |
| Colne .. .. | Mar. 31, 1930 | 19,350 | 22,103 | 19,189 | 86·0 | 2,914 | — 1,526 | 879 | 501,911 | 10·56 | 10·45 | 1·98 |
| Coventry .. .. | Mar. 31, 1930 | 90,376 | 89,085 | 72,615 | 81·0 | 16,470 | 7,632 | 1,178 | 1,358,464 | 15·738 | 15·788 | 1·99 |
| Darlington .. | Mar. 31, 1930 | — | 1,811 | 2,997 | 165·4 | — 1,186 | — | — | — | — | — | — |
| Derby .. .. | Mar. 31, 1930 | 465,218 | 41,472 | 36,487 | 87·98 | 4,985 | 352 | — | 616,421 | 16·147 | 16·147 | 1·606 |
| Douglas, I.O.M. .. | Mar. 31, 1930 | 24,535 | 21,244 | 20,757 | 97·7 | 487 | 487 | — | 488,251 | 11·630 | 11·387 | 2·096 |
| Dundee .. .. | May 15, 1930 | 43,264 | 45,298 | 34,704 | 76·612 | 10,594 | 1,343 | — | 771,780 | 14·087 | 13·786 | 1·417 |
| Eastbourne .. | Mar. 31, 1930 | 25,676 | 81,886 | 67,288 | 91·67 | 14,398 | 6,440 | — | 1,169,917 | 16·32 | 15·68 | 1·34 |
| Edinburgh.. .. | May 15, 1930 | 351,685 | 182,659 | 166,451 | 91·127 | 16,208 | 505 | — | 3,501,201 | 12·52 | 12·42 | 1·438 |
| Exeter .. .. | Mar. 31, 1930 | 19,380 | 9,725 | 8,085 | 82·94 | 1,660 | — 886 | — | 210,649 | 11·080 | 11·064 | 1·569 |
| Glasgow .. .. | May 31, 1930 | 421,237 | 349,736 | 287,191 | 77·97 | 62,545 | 1,563 | 60,982 | 5,565,616 | 15·066 | 15·060 | 1·744 |
| Gloucester .. | Mar. 31, 1930 | 16,222 | 10,877 | 8,598 | 79·0 | 2,279 | 1,952 | 1,000 | 243,697 | 10·71 | 10·71 | 1·57 |
| Great Yarmouth .. | Mar. 31, 1930 | 227,726 | 29,799 | 18,857 | 63·0 | 10,942 | 6,650 | 1,724 | 493,748 | 14·485 | 14·45 | 1·964 |
| Grimsby .. .. | Mar. 31, 1930 | 20,724 | 29,088 | 20,906 | 71·88 | 8,182 | — | — | 560,972 | 11·567 | 11·558 | 1·362 |
| Halifax .. .. | Mar. 31, 1930 | 98,100 | 28,319 | 28,303 | 99·94 | 16 | — 10,442 | — | 563,988 | 12·05 | 12·03 | 2·42 |
| Haslingden .. | Mar. 31, 1930 | 9,954 | 5,653 | 3,391 | 60·0 | 2,261 | 990 | — | 86,642 | 15·64 | 15·52 | 2·44 |
| Huddersfield .. | Mar. 31, 1930 | 18,003 | 99,130 | 85,147 | 85·89 | 13,988 | 1,371 | 8,856 | 2,180,246 | 10·91 | 10·89 | 2·78 |
| Hull .. .. | Mar. 31, 1930 | 71,329 | 74,885 | 64,725 | 86·13 | 10,160 | 380 | — | 1,309,563 | 13·72 | 13·72 | 1·77 |
| Keighley .. .. | Mar. 31, 1930 | 48,839 | 46,781 | 37,426 | 77·6 | 9,355 | 1.100 | 1,100 | — | — | — | 2·754 |
| Kilmarnock .. | May 15, 1930 | 23,232 | 25,209 | 22,142 | 87·08 | 3,067 | — 425 | — | 466,854 | 12·959 | 12·860 | 1·153 |
| Lancaster .. .. | Mar. 31, 1930 | 29,061 | 10,677 | 10,868 | 102·0 | — 191 | — 2,573 | — | 239,052 | 10·72 | 10·55 | 1·126 |
| Leeds .. .. | Mar. 31, 1930 | 164,862 | 106,273 | 131,772 | 123·9 | —25,499 | — 34,704 | — | — | — | — | — |
| Leicester .. .. | Mar. 31, 1930 | 115,224 | 89,087 | 80,891 | 91·0 | 8,196 | — 1,829 | — | 1,340,446 | 15·950 | 15·950 | 1·684 |
| Leigh .. .. | Mar. 31, 1930 | 56,949 | 46,281 | 33,894 | 73·0 | 12,337 | 7,034 | 5,336 | 909,012 | 12·22 | 12·17 | 1·79 |
| Lincoln .. .. | Mar. 31, 1930 | 101,647 | 48,270 | 39,514 | 81·86 | 8,756 | — 3,082 | — | 768,808 | 15·07 | 15·05 | 1·83 |
| Liverpool .. .. | Mar. 31, 1930 | 247,604 | — | — | — | — | — | — | 2,707,169 | — | — | — |
| Lytham S.A. .. | Mar. 31, 1930 | 13,788 | 13,386 | 13,289 | 99·27 | 97 | — 2,551 | — | 444,844 | 7·22 | 7·22 | 1·68 |
| Maidstone .. | Mar. 31, 1930 | 23,018 | 16,349 | 15,399 | 94·19 | 949 | — 2,182 | — | 802,579 | 12·967 | 12·860 | 1·378 |
| Manchester .. | Mar. 31, 1930 | 469,439 | 282,649 | 221,434 | 82·0 | 61,214 | 16,037 | 15,061 | 4,759,602 | 14·252 | 13·675 | 2·66 |
| Merthyr Tydfil .. | Mar. 31, 1930 | 29,409 | 28,109 | 23,329 | 82·99 | 8,038 | 4,780 | 4,780 | 568,457 | 11·867 | — | 2·25 |
| Middlesbrough .. | Mar. 31, 1930 | 71,883 | 28,731 | 24,942 | 88·0 | 3,789 | — 1,665 | — | 602,059 | 11·34 | 11·27 | 1·76 |
| M'cambe&Heysham | Mar. 31, 1930 | 55,179 | 37,012 | 28,348 | 76·6 | 8,664 | 1,564 | — | 701,416 | 12·67 | 12·63 | 1·76 |
| Nelson .. .. | Mar. 31, 1930 | 136,855 | 17,324 | 15,626 | 90·20 | 1,698 | — 1,489 | — | 342,818 | 12·11 | 11·36 | 1·68 |
| Newcastle .. .. | Mar. 31, 1930 | 95,947 | 108,169 | 101,142 | 93·50 | 7,027 | 6,420 | — | 2,968,109 | — | — | 2·32 |
| Newport .. .. | Mar. 31, 1930 | 44,591 | 40,226 | 37,403 | 92·981 | 2,823 | — 4,685 | 5,725 | 816,300 | 11·827 | 11·754 | 1·934 |
| Northampton .. | Mar. 31, 1930 | — | 35,589 | 30,345 | 85·0 | 5,244 | — | — | 575,448 | — | 14·62 | 1·34 |
| Nottingham .. | Mar. 31, 1930 | 61,319 | 34,519 | 23,058 | 66·8 | 11,461 | — | — | 469,580 | — | — | — |
| Oldham .. .. | Mar. 25, 1930 | 119,374 | 104,997 | 104,155 | 99·2 | 842 | — 20,073 | — | 1,776,780 | 14·183 | 14·156 | 1·838 |
| Plymouth .. .. | Mar. 31, 1930 | 160,346 | 108,730 | 83,639 | 76·0 | 25,091 | 9,853 | — | 2,183,222 | 11·952 | 11·782 | 1·732 |
| Portsmouth .. | Mar. 31, 1930 | 90,984 | 114,276 | 104,823 | 88·7 | 9,453 | — 6,064 | 14,560 | 2,031,907 | 13·50 | 13·48 | 1·53 |
| Preston .. .. | Mar. 31, 1930 | 32,199 | 26,039 | 20,488 | 78·7 | 5,551 | 1,352 | — | 365,688 | 17·089 | 17·067 | 1·438 |
| Ramsbottom .. | Mar. 31, 1930 | 21,018 | 14,124 | 12,794 | 90·51 | 1,330 | — 1,157 | — | 302,469 | 11·220 | 10·942 | 2·13 |
| Rawtenstall .. | Mar. 31, 1930 | 20,549 | 28,913 | 22,461 | 77·20 | 6,451 | 2,169 | 2,169 | 515,269 | 13·47 | 13·29 | 2·97 |
| Reading .. .. | Mar. 31, 1930 | 56,680 | 50,419 | 47,396 | 87·7 | 3,023 | — 4,736 | 3,164 | 868,354 | 13·985 | 13·813 | 2·23 |
| Rochdale .. .. | Mar. 31, 1930 | 57,624 | 81,779 | 54,004 | 66·03 | 27,775 | 16,217 | 4,173 | 1,569,367 | 12·565 | 12·533 | 2·750 |
| Rotherham .. | Mar. 31, 1930 | 67,532 | 68,334 | 47,895 | 70·0 | 20,439 | 11,191 | — | 1,183,489 | 13·87 | 13·40 | 2·70 |
| St. Helens .. | Mar. 31, 1930 | 22,222 | 21,899 | 19,836 | 90·575 | 2,063 | — 1,421 | 2,053 | 519,907 | 10·109 | 10·019 | 2·559 |
| Salford .. .. | Mar. 31, 1930 | 125,032 | 159,663 | 135,857 | 85·0 | 23,806 | 4,226 | 4,226 | 2,961,963 | 16·242 | 16·234 | 2·44 |
| Sheffield .. .. | Mar. 31, 1930 | 204,698 | 135,631 | 160,146 | 86·3 | 25,538 | 21,743 | 18,952 | — | — | — | — |
| Southampton .. | Mar. 31, 1930 | 52,174 | 45,342 | 42,438 | 94·0 | 2,804 | — 3,443 | — | 942,652 | 11·544 | 11·013 | 1·85 |
| Southport .. .. | Mar. 31, 1930 | 15,174 | 19,333 | 15,060 | 77·89 | 4,273 | 2,346 | — | 465,693 | 9·064 | 9·064 | 2·054 |
| South Shields .. | Mar. 31, 1930 | 13,218 | 13,247 | 12,981 | 97·98 | 266 | — 2,169 | — | 286,719 | 11·089 | 11·078 | 2·075 |
| Stalybridge .. | Mar. 31, 1930 | 66,157 | 79,579 | 59,195 | 74·38 | 20,384 | 14,597 | 6,300 | 1,496,936 | 12·758 | 12·665 | 1·81 |
| Stockport .. .. | Mar. 31, 1930 | 58,670 | 56,714 | 48,075 | 84·76 | 8,639 | 2,269 | 6,370 | 1,133,031 | 12·01 | 11·99 | 1·36 |
| Stockton .. .. | Mar. 31, 1930 | 74,042 | 69,797 | 56,277 | 81·80 | 13,520 | 7,222 | 4,673 | 1,089,369 | 15·38 | 15·14 | 2·1 |
| Sunderland .. | Mar. 31, 1930 | 15,900 | 13,753 | 11,612 | 84·43 | 2,141 | 1,584 | 578 | 249,150 | — | 13·248 | 1·13 |
| Swindon .. .. | Mar. 31, 1930 | 58,185 | 40,679 | 38,222 | 94·0 | 2,457 | — 3,500 | — | 780,268 | 12·51 | 12·43 | 1·49 |
| Tees-side .. .. | Mar. 31, 1930 | 5,456 | 7,404 | 6,916 | 93·4 | 488 | — | — | 180,726 | 9·91 | 9·83 | 2·01 |
| Wallasey .. .. | Mar. 31, 1930 | 138,446 | 109,284 | 67,940 | 62·17 | 41,344 | 24,047 | 2,890 | 1,428,302 | 18·36 | 18·33 | 2·08 |
| Walsall .. .. | Mar. 31, 1930 | 155,975 | 138,904 | 95,861 | 68·711 | 43,043 | 20,302 | — | 2,491,128 | 13·443 | 12·906 | 2·511 |
| Warrington .. | Mar. 31, 1930 | 25,100 | 24,137 | 16,482 | 71·747 | 7,654 | 6,895 | — | 298,083 | 19·648 | 19·432 | 1·106 |
| West Bridgford .. | Mar. 31, 1930 | 18,226 | 23,083 | 21,283 | 73·5 | 6,012 | 1,800 | — | 476,033 | 11·61 | — | — |
| West Bromwich .. | Mar. 31, 1930 | 61,258 | 35,304 | 27,004 | 81·37 | 8,300 | 2,782 | — | 655,691 | 12·922 | 12·893 | 1·937 |
| West Hartlepool .. | Mar. 31, 1930 | 29,254 | 21,495 | 15,257 | 75·0 | 6,238 | 2,793 | — | 415,428 | 12·42 | 12·36 | 2·56 |
| Wigan .. .. | Mar. 31, 1930 | 70,657 | 64,925 | 52,952 | 82·17 | 11,973 | 2,862 | 943 | 1,204,902 | 12·93 | 12·91 | 2·13 |
| Wolverhampton .. | Mar. 31, 1930 | 117,017 | 143,536 | 117,300 | 80·38 | 26,236 | — | 3,301 | 2,251,607 | 15·300 | 15·172 | 2·045 |
| York .. .. | Mar. 31, 1930 | 28,241 | 23,202 | 19,435 | 83·76 | 3,767 | — 18 | — | 519,612 | 10·71 | 10·63 | 1·95 |

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# MUNICIPAL OMNIBUS RECORDS

| NAME | Operating Expenses per Bus Mile | | | | | | | Length of Route | Average Miles per Day per Bus | Average Speed per Hour | Number of Buses | | Total Passengers Carried | Passengers per Bus Mile | Average Distance of 1d. Fare. Miles |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Traffic d. | General d. | Licences d. | Repairs and Maintenance d. | Fuel d. | Miscellaneous d. | Total d. | Miles | d. | Miles | In Use Daily | In Stock | | | |
| Aberdeen | 3·692 | ·629 | ·447 | 1·581 | 2·227 | ·031 | 8·600 | 15·67 | 94·0 | 9·20 | 60 | 63 | 17,285,230 | 8·52 | ·97 |
| Accrington | — | — | — | — | — | — | — | — | — | — | — | 12 | 1,223,216 | — | — |
| Ashton-U.-L. | 4·208 | 1·059 | ·452 | 2·889 | 2·581 | — | 11·189 | 13·0 | 125·0 | 12·0 | 11 | 15 | 4,821,767 | 11·24 | ·70 |
| Barrow | 3·73 | ·72 | ·40 | 1·21 | 2·13 | — | 8·19 | 24·35 | 109·5 | 11·63 | 14 | 16 | 3,228,179 | 8·94 | ·80 |
| Belfast | 3·20 | ·68 | ·47 | 2·01 | 1·79 | 1·55 | 9·70 | 42·0 | 102·0 | 10·5 | 50 | 58 | 7,497,972 | 4·65 | 1·125 |
| Birkenhead | 5·096 | 1·052 | ·657 | 1·412 | 2·211 | ·139 | 10·567 | 77·81 | 96·76 | 10·0 | 74 | 105 | 22,218,135 | 8·37 | ·75 |
| Birmingham | 5·425 | ·665 | ·578 | 2·939 | 2·712 | ·300 | 12·619 | 90·54 | 117·3 | 9·98 | 285 | 314 | 99,881,142 | 9·58 | 1·00 |
| Blackburn | 6·74 | 1·58 | ·65 | 3·12 | 2·91 | — | 15·00 | 16·92 | 110·0 | 10·5 | 10 | 12 | 870,918 | 7·0 | — |
| Blackpool | 5·35 | ·81 | — | 1·16 | 2·66 | — | 9·98 | 50·0 | — | — | 45 | 62 | 8,791,032 | 5·37 | — |
| Bolton | — | — | — | — | — | — | — | — | — | — | — | 53 | — | — | — |
| Bournemouth | 4·32 | 1·36 | ·74 | 2·44 | 2·84 | — | 11·7 | 13·0 | 93·0 | 10·0 | 15 | 25 | 3,734,744 | 7·80 | ·75 |
| Bradford | — | — | — | — | — | — | — | 73·28 | — | 10·41 | 61 | 90 | 20,289,359 | — | ·81 |
| Burnley | 3·797 | ·463 | ·300 | 1·685 | 2·205 | ·067 | 8·517 | 14·5 | 121·0 | 10·0 | 23 | 25 | 5,681,369 | 5·46 | ·5 |
| Burton | 3·78 | ·81 | ·50 | 1·16 | 2·23 | — | 8·48 | 19·0 | 82·0 | 7·41 | 34 | 41 | 3,958,324 | 5·80 | ·621 |
| Bury | 3·288 | ·709 | ·318 | 1·402 | 2·289 | — | 8·006 | 87·25 | 146·0 | 13·60 | 18 | 19 | 3,868,640 | 5·6 | ·73 |
| Cardiff | 6·36 | ·55 | — | 2·23 | 2·47 | ·09 | 11·70 | 77·0 | 143·0 | 7·6 | 75 | 94 | 12,026,303 | 4·09 | ·66 |
| Chester | 5·24 | 2·02 | ·66 | 1·42 | 2·16 | ·12 | 11·62 | 7·7 | 116·0 | 9·0 | 14 | 16 | 714,014 | 10·0 | ·8 |
| Chesterfield | 4·63 | 1·02 | ·57 | 1·81 | 2·13 | — | 10·16 | 40·0 | 136·0 | 12·0 | 30 | 62 | 7,466,608 | 5·15 | ·73 |
| Colchester | 4·662 | ·960 | ·573 | 1·714 | 1·975 | — | 9·884 | 12·49 | 103·33 | 7·97 | 12·91 | 19 | 3,480,224 | 7·14 | ·60 |
| Colne | 3·56 | ·71 | ·53 | 2·24 | 2·13 | — | 9·17 | 22·75 | 69·0 | 10·0 | 18 | 22 | 2,647,421 | 5·27 | ·75 |
| Coventry | 4·955 | 1·356 | ·482 | 2·988 | 3·014 | ·034 | 12·829 | 40·0 | 101·0 | 8·77 | 38 | 43 | 10,739,488 | 7·9 | ·67 |
| Darlington | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Derby | 6·691 | 1·096 | 1·040 | 2·310 | 2·836 | ·233 | 14·206 | 12·75 | 119·0 | 7·80 | 12 | 29 | 6,199,388 | 10·057 | ·63 |
| Douglas, I.O.M. | — | — | — | — | — | — | 11·376 | 8·25 | 92·0 | 13·5 | 22 | 33 | 2,380,611 | 5·43 | ·65 |
| Dundee | 4·611 | ·934 | ·520 | 2·010 | 2·718 | — | 10·793 | 20·23 | 117·0 | 10·75 | 18 | 28 | 7,505,269 | 9·724 | ·893 |
| Eastbourne | 6·73 | ·22 | ·58 | 2·29 | 2·20 | 2·94 | 14·96 | — | — | — | — | 53 | 14,063,225 | 12·02 | — |
| Edinburgh | 5·024 | ·707 | ·511 | 2·138 | 2·735 | ·294 | 11·409 | 51·0 | 110·0 | 9·5 | 90 | 148 | 29,437,803 | 8·41 | ·87 |
| Exeter | 4·071 | 1·265 | ·514 | 1·058 | 2·281 | — | 9·189 | 10·19 | 130·66 | 7·79 | 7 | 10 | 1,485,075 | 7·05 | ·51 |
| Glasgow | 4·390 | ·865 | ·537 | 2·689 | 3·079 | ·181 | 11·741 | 87·90 | 142·10 | 10·98 | 107·31 | 201 | 48,066,753 | 8·636 | 1·15 |
| Gloucester | 4·09 | ·98 | ·44 | ·74 | 2·00 | ·22 | 8·47 | 10·37 | 99·4 | 7·66 | 12 | 16 | 1,657,867 | 6·80 | ·5 |
| Great Yarmouth | 4·048 | 1·171 | ·463 | 1·393 | 2·091 | — | 9·166 | — | 122·0 | — | 11·02 | 21 | 3,632,614 | 7·36 | — |
| Grimsby | 4·029 | ·598 | ·317 | 1·532 | 1·838 | — | 8·314 | 10·89 | 118·0 | 10·07 | 14 | 17 | 4,663,480 | 8·3 | ·94 |
| Halifax | 4·558 | ·868 | ·456 | 2·946 | 3·216 | — | 12·044 | 23·92 | 80·93 | — | 19 | 28 | 2,800,372 | 4·96 | — |
| Haslingden | 3·69 | ·70 | ·70 | 1·79 | 2·50 | — | 9·38 | 7·0 | 59·0 | — | 4 | 10 | 538,208 | 6·0 | 1·16 |
| Huddersfield | 3·16 | ·71 | ·39 | 2·14 | 2·97 | — | 9·37 | 117·0 | 115·0 | 10·09 | 52 | 64 | 8,532,763 | 3·91 | 1·06 |
| Hull | 5·09 | ·48 | ·69 | 2·55 | 2·82 | ·23 | 11·86 | 19·36 | 105·92 | 7·78 | 28·83 | 45 | 10,105,342 | 7·72 | — |
| Keighley | — | — | — | — | — | — | — | 45·0 | — | — | 28 | 30 | — | — | — |
| Kilmarnock | 5·164 | 1·136 | ·452 | 2·024 | 2·510 | — | 11·286 | 7·0 | 110·35 | 7·40 | 11·59 | 16 | 5,207,184 | 11·15 | ·80 |
| Lancaster | 2·67 | 2·33 | ·90 | 1·76 | 3·02 | ·23 | 10·91 | 12·9 | 65·0 | 8·5 | 9·5 | 19 | 1,990,029 | 8·56 | 1·0 |
| Leeds | — | — | — | — | — | — | — | 90·25 | — | — | — | 81 | 13,338,041 | — | ·71 |
| Leicester | 7·950 | ·642 | ·693 | 1·920 | 3·234 | ·044 | 14·483 | 16·60 | 83·46 | 8·929 | 44 | 52 | 12,694,018 | 9·47 | 1·042 |
| Leigh | 4·30 | 1·07 | ·46 | 1·17 | 1·95 | — | 8·95 | 14·83 | 97·0 | 10·0 | 24 | 29 | 4,964,838 | 5·32 | ·59 |
| Lincoln | 5·41 | 1·36 | ·66 | 2·08 | 2·55 | ·28 | 12·34 | 21·25 | 105·60 | 9·3 | 20 | 32 | 6,280,419 | 8·17 | ·75 |
| Liverpool | — | — | — | — | — | — | — | — | — | — | — | — | 23,547,341 | — | — |
| Lytham S.A. | 2·29 | ·58 | ·25 | 2·12 | 1·87 | ·06 | 7·17 | 15·23 | 150·0 | 8·75 | 10 | 13 | 1,896,268 | 4·26 | ·666 |
| Maidstone | 5·130 | 1·024 | ·710 | 2·440 | 2·910 | — | 12·214 | 6·248 | 76·9 | 8·03 | 10·8 | 14 | 2,823,400 | 9·331 | ·598 |
| Manchester | 5·047 | ·739 | ·371 | 2·508 | 2·217 | ·284 | 11·166 | 210·0 | 93·1 | 10·96 | 140 | 190 | 24,430,042 | 5·13 | ·898 |
| Merthyr Tydfil | — | — | — | — | — | — | 8·473 | 26·0 | 82·0 | — | 18 | 23 | 2,996,672 | — | — |
| Middlesbrough | 4·12 | 1·04 | ·46 | 1·74 | 2·43 | ·04 | 9·83 | 17·18 | 123·50 | 8·3 | 14 | 22 | 3,737,022 | 6·20 | 1·0 |
| M'cambe&Heysham | 4·52 | ·82 | ·47 | 1·64 | 2·25 | — | 9·70 | 13·53 | 68·8 | 9·12 | 21·5 | 28 | 5,040,438 | 7·04 | ·799 |
| Nelson | 4·48 | ·70 | ·46 | 1·88 | 3·41 | — | 10·93 | 11·25 | 85·0 | 6·0 | 11 | 14 | 2,278,160 | 6·65 | ·75 |
| Newcastle | 3·739 | ·376 | ·332 | 1·715 | 2·016 | — | 8·178 | 71·5 | 155·0 | 12·88 | 47 | 72 | 11,135,707 | 3·75 | ·91 |
| Newport | 4·768 | ·942 | ·461 | 2·290 | 2·536 | — | 10·997 | 28·0 | 130·0 | 10·0 | 30 | 34 | 4,959,790 | 6·076 | ·875 |
| Northampton | 4·35 | 1·56 | ·85 | 2·18 | 3·71 | — | 12·65 | 14·175 | 128·58 | 7·27 | 43 | 50 | 6,261,503 | 10·9 | — |
| Nottingham | 6·64 | — | — | — | 2·17 | — | 11·91 | — | — | — | — | — | — | — | — |
| Oldham | 5·091 | ·664 | ·618 | 4·290 | 3·406 | — | 14·069 | 102·0 | 81·0 | 11·0 | 43·5 | 58 | 13,635,511 | 7·755 | ·80 |
| Plymouth | 3·310 | ·474 | ·339 | 2·711 | 2·360 | — | 9·194 | 45·0 | 103·0 | 9·13 | 58 | 78 | 14,847,535 | 6·80 | ·74 |
| Portsmouth | 5·202 | 1·102 | ·517 | 2·742 | 2·870 | ·033 | 12·466 | 21·33 | 130·0 | 10·0 | 47 | 57 | 17,867 070 | 8·8 | ·25 |
| Preston | 6·434 | 1·123 | ·781 | 1·958 | 2·925 | ·225 | 13·446 | 7·84 | 104·0 | 8·0 | 11 | 19 | 4,195,628 | 11·473 | ·511 |
| Ramsbottom | 4·164 | 1·313 | ·465 | 1·917 | 2·287 | — | 10·146 | 26·0 | 58·62 | 13·5 | 10 | 14 | 1,585,929 | 5·90 | 1·0 |
| Rawtenstall | 4·67 | ·77 | ·42 | 2·19 | 2·41 | — | 10·46 | 40·77 | 101·0 | 11·0 | 12 | 14 | 2,308,264 | 4·48 | ·676 |
| Reading | 4·818 | ·633 | ·515 | 3·465 | 2·794 | ·874 | 13·099 | 25·0 | 125·0 | 9·0 | 24 | 29 | 5,171,888 | 5·95 | ·61 |
| Rochdale | 3·908 | ·564 | ·355 | 1·439 | 1·994 | — | 8·260 | 93·0 | 143·0 | 11·0 | 28 | 33 | 7,137,023 | 4·54 | ·75 |
| Rotherham | — | — | — | — | 2·1 | — | — | 111·784 | 88·0 | 10·1 | 37 | 46 | 5,854,274 | 4·8 | ·88 |
| St. Helens | 3·407 | ·875 | ·480 | 2·049 | 2·057 | ·289 | 9·157 | 30·0 | 99·0 | 12·0 | 14 | 20 | 2,035,263 | 3·91 | ·744 |
| Salford | 4·543 | ·952 | ·372 | 2·591 | 2·336 | — | 10·794 | 162·07 | 156·0 | 12·0 | 52 | 76 | 15,479,986 | 5·23 | 1·05 |
| Sheffield | — | — | — | — | — | — | — | 300·0 | — | 12·6 | 131 | 162 | 28,093,352 | — | 1·035 |
| Southampton | 3·889 | 1·453 | ·501 | 2·535 | 2·427 | — | 10·805 | 28·0 | 130·0 | 9·656 | 34 | 37 | 5,612,199 | 5·954 | ·7 |
| Southport | 3·151 | ·607 | ·377 | 1·553 | 1·899 | ·175 | 7·762 | 14·9 | 159·0 | 11·550 | 9 | 11 | 2,258,633 | 4·850 | 1·2 |
| South Shields | 4·550 | ·646 | ·488 | 2·554 | 2·628 | — | 10·866 | 6·755 | 117·0 | 9·26 | 6 | 14 | 1,494,339 | 5·21 | ·542 |
| Stalybridge | 4·208 | ·799 | ·409 | 1·642 | 2·488 | — | 9·546 | 55·17 | 121·0 | 12·0 | 43 | 56 | 10,447,725 | 6·97 | ·6125 |
| Stockport | 4·725 | ·923 | ·448 | 1·698 | 2·389 | 1·349 | 11·532 | 41·62 | 85·0 | 11·42 | 32 | 42 | 8,141,346 | 7·19 | 1·0 |
| Stockton | 5·07 | ·70 | ·77 | 2·68 | 3·18 | — | 12·40 | 27·0 | 64·88 | 10·6 | 46 | 47 | 7,920,996 | 7·2 | ·730 |
| Sunderland | 5·049 | 2·341 | ·635 | ·871 | 2·290 | — | 11·226 | 11·05 | 75·8 | 8·5 | 9 | 13 | 2,910,486 | 11·7 | 1·3 |
| Swindon | 5·16 | 1·01 | ·65 | 2·18 | 2·59 | ·16 | 11·75 | 21·1 | 126·0 | 9·0 | 25 | 38 | 6,504,693 | 8·34 | ·6 |
| Tees-side | 3·72 | 1·34 | ·40 | 1·56 | 2·16 | — | 9·18 | 5·37 | 123·0 | 10·0 | 4 | 4 | 883,396 | 4·88 | ·5 |
| Wallasey | 5·13 | 1·15 | ·89 | 1·16 | 3·04 | ·04 | 11·41 | 23·0 | 97·83 | 11·97 | 40 | 56 | 12,560,361 | 8·79 | ·544 |
| Walsall | 4·777 | ·916 | ·447 | 1·400 | 1·695 | ·002 | 9·237 | 211·0 | 107·0 | 9·498 | 64 | 77 | 12,803,948 | 5·140 | ·69 |
| Warrington | 6·506 | ·811 | ·923 | 1·783 | 3·247 | ·001 | 13·270 | 4·83 | 115·511 | 7·219 | 7·07 | 13 | 5,235,511 | 17·564 | ·805 |
| West Bridgford | — | — | — | ·77 | — | — | 10·73 | — | 160·0 | 10·2 | 14 | 18 | 3,396,039 | 6·92 | 1·2 |
| West Bromwich | 4·229 | 1·169 | ·503 | 1·415 | 2·568 | — | 9·884 | 30·52 | 80·595 | 9·24 | 30 | 33 | 4,770,242 | 6·268 | 1·097 |
| West Hartlepool | 2·70 | ·79 | ·51 | 2·61 | 2·20 | — | 8·81 | 23·69 | 95·0 | 7·5 | 12 | 16 | 1,999,135 | 4·81 | ·67 |
| Wigan | 4·48 | 1·18 | ·42 | 2·21 | 2·22 | ·03 | 10·54 | 52·64 | 123·0 | 10·55 | 29 | 36 | 7,299,070 | 6·06 | ·71 |
| Wolverhampton | 5·558 | ·969 | ·540 | 2·243 | 2·955 | ·034 | 12·299 | 155·0 | 122·0 | 8·607 | 51 | 69 | 15,522,399 | 6·75 | ·835 |
| York | 3·77 | ·88 | ·44 | 1·51 | 2·34 | ·03 | 8·97 | 15·91 | 79·0 | 8·97 | 18 | 21 | 2,824,514 | 5·435 | — |

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# OMNIBUS AND COACH SECTION

## A.E.C. DEMONSTRATE THEIR 95 H.P. OIL ENGINE.

SEVERAL VEHICLES TO BE RUN IN LONDON OMNIBUS SERVICE.

At the Southall (Middlesex) works of the Associated Equipment Co., Ltd., and also on the Great West Road, a large company of visitors, on October 30, witnessed a striking demonstration of the capabilities of the high-speed oil engine which the A.E.C. staff has developed for heavy traction during the past two and a-half years. Early in 1928 the management determined that the A.E.C. should be one of the first firms to produce a satisfactory oil engine for road work, and after tests of the systems then in existence, it was agreed that the Acro engine, of German origin, offered the greatest promise towards the desired end. The result of the enterprise of the A.E.C. is now to be seen in a re-designed engine which is entirely British, with the exception of the fuel pump of the Bosch type. The engine is not constructed on the Diesel principle, but is of the compression-ignition type.

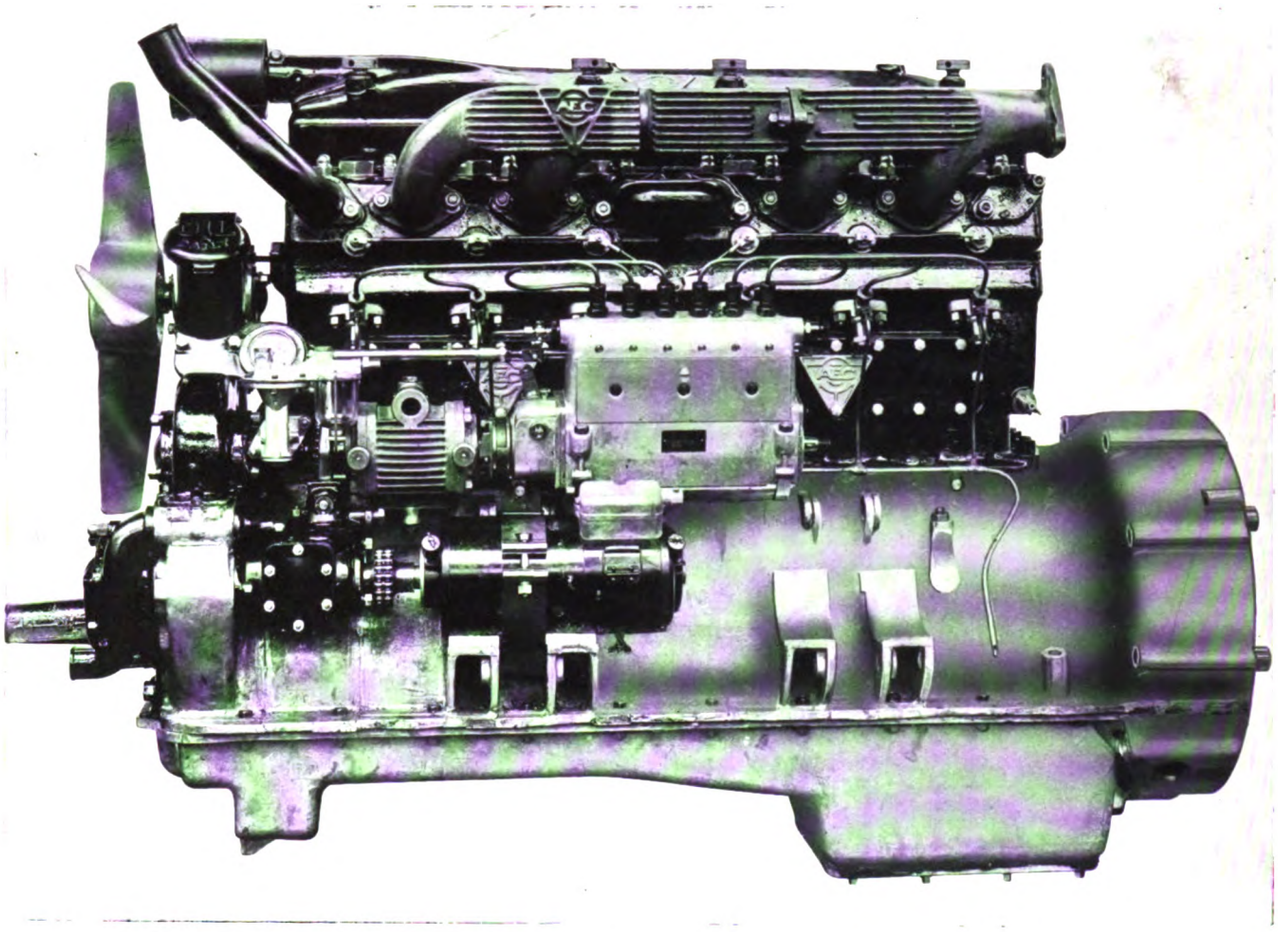
The six-cylinder engine is now in the production stage, and several omnibuses of the London General Co., which have been fitted with it, are being placed in service. The engine weighs no more than a petrol engine of corresponding size, the actual weight being less than 1,350 lb., complete with all accessories and flywheel, or 14 lb. per B.H.P. at a rated horse-power of 95. The speed range obtained in service is from 300 R.P.M. to 3,000 R.P.M., which equals that of a petrol engine for similar service, and is claimed to be 1,000 R.P.M. above any other engine now in production. Thus the A.E.C. engine is comparable in every way with the best features of a modern petrol engine. As regards high speed, flexibility, and light weight it is quite distinct from the marine type of high-speed oil engine.

Tests of the A.E.C. engineers' improvements of the Acro engine in adapting it to road service have been thorough and effective. Promising results came from the first road trials with a 5-ton lorry, a fuel consumption of 10 to 10½ M.P.G. being obtained with a gross weight of 10½ tons over average main roads. For the passenger transport test the engine was fitted to the company's six-wheel omnibus carrying 104 passengers and used for bringing employees from Walthamstow (the former home of the company) to Southall. Starting in December, 1928, this service was performed most successfully for several months.

Thenceforward attention was devoted to developing this engine, which had been designed throughout as an oil engine. This re-design ensured that all parts should be suited for the load conditions of an oil engine.

Before proceeding with the final six-cylinder engine, however, research was done on a single-cylinder engine built in order to obtain the best balance between the numerous variable factors, many of which are inter-related and mutually influence each other. Hundreds of runs were made before arriving at a decision on the various details. Factors governing the injection of the fuel were of great importance, for the rate at which the fuel is admitted to the cylinder has a marked effect on the running of the engine, particularly as to smoothness. In fact, upon the rate of injection depends the efficiency of the engine. Rapid injection gives uncontrolled combustion and a heavy knock. If injection is too slow, the knock will be reduced or possibly avoided, but the efficiency of the engine will be adversely affected. Injection pressure and fuel-pump timings had also to be determined.

Finally came the design for a six-cylinder engine. It was necessary to produce an engine of the required size which would interchange with the six-cylinder petrol engine fitted to the new range of goods chassis, and to evolve an engine having a horse-power weight ratio which was as nearly as possible of the same order



Near Side of the High Speed Six-Cylinder Oil Engine Developed by the Associated Equipment Co.

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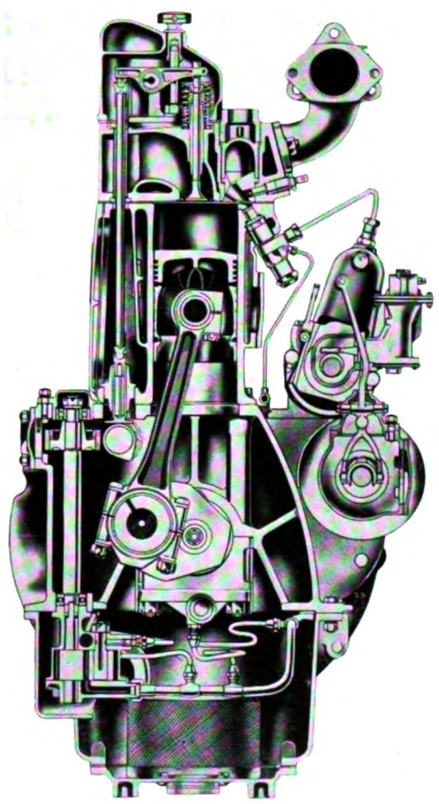
# OMNIBUS AND COACH SECTION

as that of the corresponding petrol engine. The design finally decided upon comprised six cylinders, 110 mm. bore by 142 mm. stroke, the swept volume being nearly 8·1 litres (equivalent almost to 630 cu. in.). Monobloc construction ensures maximum rigidity. As the main-bearing bolts are brought up through the top of the crankcase to form the fixing for the cylinders, the two castings are thus made into what is practically a single part, the crankcase itself being relieved of all strains from the gas-pressure load.

The cylinder heads are arranged into two groups each covering three cylinders and carrying the valves and the Acro combustion chamber. The valves are operated through push-rods from a camshaft located in the crankcase, the necessary adjustment being made readily accessible by providing a screw in one end of each rocking lever. The crankshaft has seven main bearings, and is made exceptionally stiff, though weight has been reduced by hollowing both the main and crank-pin journals. Heat-treated Y-alloy is used for the pistons, this material being light yet strong. Loads carried by the pistons total as much as 7,500 lb. under compression alone, and will reach nearly twice that figure under

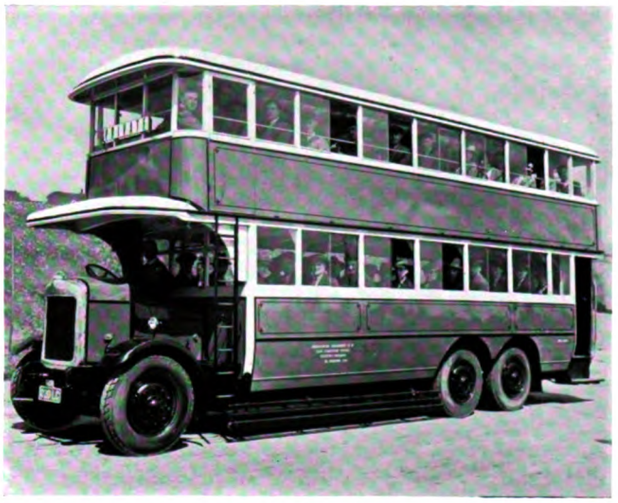


A Cross Section View of the 95 H.P. Oil Engine.

full-load conditions. To accommodate these loads the gudgeon pin has a diameter of 40 mm. By hollowing the pin the weight has been kept at a minimum, a process that can be carried to a much greater extent than usual on account of the stiffness of a pin of such dimensions.

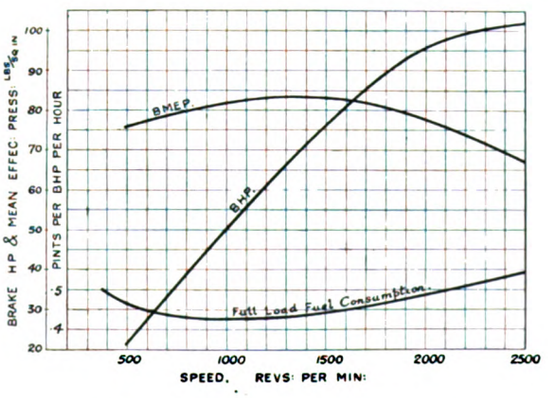
The areas for both the main and connecting-rod bearings have been carefully considered and the loading conditions thoroughly analysed. It was found that although the maximum load to be carried was high the duration of the high load was short, actually shorter in fact than that found in petrol engines, a feature which is reflected favourably in bearing life in the oil engine. The valves are of the same material, silico chrome, which has been found to be so satisfactory in the A.E.C. petrol engine. There is, however, every indication that the valve life will be even longer in the case of the A.E.C. oil engine on account of the much lower temperature reached by the exhaust gases.

All main bearings and crank-pin bearings are lubricated by oil under pressure, the camshaft, pistons and gudgeon pins being lubricated by splash. Low-pressure oil for the valve rocker is obtained by a patented device which "bleeds" a limited supply from the high-pressure system and reduces this pressure to a low figure. This oil is fed into the interior of the rocker shaft at the rear end, and reaches each rocker through holes drilled in the shaft. Surplus oil is carried down at the front end of the engine and is fed on to the spiral gears driving the oil pump.



104-Seat Omnibus fitted with the 95 H.P. Engine.

The camshaft and the auxiliaries, including the fan, are driven by a single triplex roller chain which is kept at the correct tension by an automatic tensioner. The use of a single long chain with ample area to resist wear provides a good shock-resisting drive which insulates the auxiliaries from crankshaft vibrations. As the auxiliaries are fitted on the near-side the engine is suitable for the fo ward driving position of the Mammoth goods chassis of the A.E.C.




Power and Consumption Curve.

The engine governor limits the minimum but not the maximum speed. This becomes necessary, partly to correct the difference in operating conditions between a hot and cold engine, but also to take care of a peculiarity, common to all fuel pumps. This peculiarity is that for a given setting the quantity of fuel discharged increases slightly as the speed increases. It will then, sometimes, happen that after accelerating, the engine does not slow down sufficiently quickly to allow of easy gear changing, and it is to avoid this difficulty that the governor is fitted. The governor provides an additional and valuable feature in that, when coasting, the fuel supply to the engine is cut off entirely as soon as the engine speed exceeds 400 R.P.M., thus providing an additional source of economy, and also an effective engine brake.

The fuel pump is driven at half engine speed. It has a special camshaft to give the rate of injection, determined as before

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# OMNIBUS AND COACH SECTION

mentioned, from the research on the Bosch pump at Southall. The fuel tank is mounted on the frame, and to relieve the fuel pump from the necessity of lifting the fuel from the tank, an A.C. diaphragm pump is fitted and driven off the same shaft as the fuel pump. The fuel is fed at a pressure of about 3 lb. per sq. in. to the main pump, which is thus relieved of all duty save metering and injecting the required quantity of fuel.

A new auxiliary is the exhauster, which is supplied to provide the vacuum needed to operate the servo brakes. The control of the oil engine is entirely on the fuel supply, the air drawn into the engine remaining constant. No throttle is therefore required, and there is never at any time a vacuum in the inlet manifold. This exhauster pump supplies the deficiency.

Saving of fuel cost has been demonstrated most strikingly by the exacting tests of the six-cylinder engines carried out by the A.E.C. and by transport operators. An oil engine which had been fitted to a lorry in place of a petrol engine gave over many months' operation an average consumption of 9·7 M.P.G. as against 5 M.P.G. for the petrol engine doing exactly the same work. Between Bagshot-London and London-Oxford the oil engine has given 12·1 and 10·2 M.P.G. respectively. In a run across London, from Ealing to Woolwich and back, the result was 9·1 M.P.G. The least favourable consumption was 8·7 on the London-Penzance route via Porlock Hill. For a petrol vehicle the corresponding figures for the foregoing routes are 5 to 6 M.P.G.

Whereas the fuel consumption per B.H.P. of the petrol engine increases as the load decreases, that of the oil engine decreases slightly at first, and after remaining practically constant for over a considerable range, finally increases somewhat under the very light loads. At quarter load, however, the consumption is only a very little over half that of the petrol engine. As the average load is probably somewhere about 40 per cent. of full load, at which point the consumption for the oil engine is about 60 per cent. of that of the petrol engine, the saving is obvious.

It is a tribute to the effectiveness of the research and construction work of the A.E.C. that the engine which they originally built has stood the severest tests and that it has not been necessary to re-design any important part.

Four of the engines were on view at Southall, together with working models of the fuel pump and injection system, and a cross-section of a cylinder. Demonstrations were given on the Great West Road in a double-deck Regent of the London General Omnibus Co., the vehicle being capable of a speed of between 45 and 50 M.P.H. The only noticeable difference from a petrol engine was a little more "noise" at slow speeds.

## MESSRS. CHAS. ROBERTS' COACHWORKS.

A number of omnibus operators and representatives of the Press visited the works of Messrs. Charles Roberts at Horbury Junction, near Wakefield, on Tuesday, November 4th. A tour of the works, which cover in all thirty acres of ground, proved extremely interesting, and revealed that although Messrs. Roberts may not have been in the coach-building industry as long as some other firms, they are at any rate giving considerable attention to this branch of their manufactures, since they have a very complete plant for the purpose. Moreover, the two partially-finished omnibuses in course of preparation for the Glasgow Motor Show, a 32-seater "Service" omnibus mounted on an A.J.S. "OT4" chassis, and a 28-seater de Luxe body specially designed for the Commer "Avenger" chassis, gave evidence of excellent material and workmanship and presented a handsome appearance. Both bodies comply with the new Ministry of Transport regulations, and the long-distance coach has two emergency doors besides the sliding door at the front of the near-side for ordinary use.

At the luncheon which followed the tour of the works, Mr. Duncan Bailey, chairman of the company, explained how, although they had been concerned in the manufacture of railway wagons for the past 70 years, they had been induced to turn their attention also to commercial road vehicles by the evident tendency to transfer to the roads some, at any rate, of the traffic which has been hitherto carried by rail. He wished to emphasise that they had no intention of treating the coach-building department as a subsidiary department of minor importance, but proposed that it should develop freely in its own sphere although still retaining it under the general management.

## FRONT WHEEL GUARD FOR OMNIBUSES.

A Device on Trial at Birmingham.

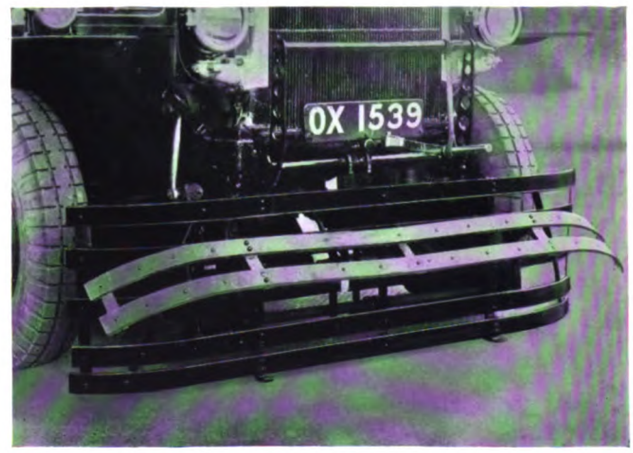
For several months past the Birmingham Corporation Tramways and Omnibus Department has been operating a motor omnibus which is fitted with a guard to the front wheels. This guard is patented, and although it is not designed to pick up a person as is often done by the tramcar lifeguard, it promises to be effective in pushing an obstacle out of the way of the omnibus. Its effectiveness for that task was demonstrated before the guard was fitted

Pilot and Main Guards ready for Service.

to a service omnibus. As the majority of accidents usually occur through persons darting in front of an omnibus coming to rest or about to start, the act of being pushed away by the guard may involve nothing worse than a shaking.

The device consists of a pilot guard and a main guard, which are attached to the front axle. Both guards are of the maximum width allowable, namely, 7 ft. 6 in. The guards are made of duralumin, and they are attached to the axle by steel brackets. When the guard is set the main and pilot guards are in a vertical position about 5 in. from the ground.

If an object strikes the pilot guard, it moves back and upwards, thus automatically operating the main guard, moving it backwards




Position of Guards after Operation.

and downwards until the skids on its base ride on the road surface and prevent the object from getting underneath the omnibus or being run over by a wheel. Both ends of the guard are curved, as shown in the illustrations,

In addition to working automatically the guard may be operated by the driver by means of a lever inside his cab, thus enabling him to lower the guard if he sees that an accident is imminent.

One illustration shows the guard set clear of the ground ready for service. The other photograph depicts the guard operated with the pilot guard raised and the main guard lowered.

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# OMNIBUS AND COACH SECTION

## THE INVICTA DIESEL ENGINE.

A PRODUCT OF MESSRS. AVELING & PORTER'S WORKS.

A high place among Diesel engines of British construction is deservedly claimed for the Invicta engine which Aveling & Porter, Ltd., have been developing at their Rochester works since January, 1928. It has now reached a stage at which it is reliable and economical for agricultural tractor and road passenger and commercial vehicle work.

The engine is constructed under Acro licence, and before describing its details as developed by Aveling & Porter, Ltd., reference may be made to its performances in the World Agricultural Tractor Trials held at Ardington, near Wantage, on September 16-19. There were four other Diesel tractors in the competition, viz., the Blackstone, Mercedes-Benz, McLaren, and Marshall. In the rated load tests the Aveling & Porter Invicta stood first under the heading of mean power delivered in an hour, its figures being 39·4 H.P., the next highest being 27 H.P. by the McLaren. Fuel consumption was only 0·55 lb. per hour. Maximum load tests of mean power delivered in one hour were headed by the Invicta with 42·4 H.P., the next highest being 37·7 H.P. by the Blackstone. Fuel consumption was 0·60 lb. per hour. Both performances were far in advance of those of paraffin and petrol tractors, and considerably better than those of four semi-Diesel tractors. The Invicta also led in the eight-hours rated load drawbar tests, showing 21·5 H.P. as the mean drawbar power, the next best being the Blackstone. Invicta's fuel consumption was the lowest, being only 0·73 lb. per H.P. hour, as against 0·84 for the highest. In the maximum drawbar tests—bottom, intermediate and top gears—the Invicta showed by far the highest horse-power with 30, 26·9 and 23·4 respectively. As to stoppages for repairs, etc., the Invicta had a clean sheet. The official report stated that the Diesel average fuel costs per 100 H.P. hours show a very large saving over those in both the paraffin and petrol groups, that the average cost of lubricating oil is rather higher, and that the lower-priced Diesel tractors are no higher than the higher-priced paraffin and petrol tractors. The Invicta stood next to the lowest with £22 as the price per rated D.B.H.P. The lowest was £19; the highest £35.

Aveling & Porter, Ltd., whose history as traction engineers goes back eighty years, intend to produce the most efficient Diesel engine. Since they became associated ten years ago with the great engineering group known as Agricultural and General Engineers, Ltd., they have reconstructed a large area of their works, and added a Diesel engine section. The "A.A." series of this high-speed, high-power engine is now in production under Aero licence, and as it sets a standard of performance which will be followed for some time to come the company has confidence in inviting those who are interested to consult them. The engine has four vertical cylinders, valve in head, with 4⅜ in. bore and 6⅜ in. stroke. The R.A.C. rating is 30·6 H.P., developing 22·5 B.H.P. at 500 R.P.M., 40·0 at 1,000 R.P.M., 50·0 at 1,300 R.P.M.; Normal horse-power for continuous duty—(*a*) with cast-iron pistons: 35·0 at 1,000 R.P.M., 42·0 at 1,200 R.P.M., 45·0 at 1,300 R.P.M.; (*b*) with aluminium alloy pistons: 52·0 at 1,500 R.P.M., 62·5 at 1,800 R.P.M. Fuel consumption is given as 0·44 lb. per B.H.P. at normal speed and load. At current price of heavy oil this represents ¼d. per H.P. hour. Consumption of lubricating oil is 0·004 to 0·008 lb. per B.H.P. hour, according to load and speed. The weight of the engine is only 1,000 lb. with aluminium alloy cylinder block; 1,450 lb. with cast-iron cylinder block.

A feature of the cylinders is that they are fitted with removable wet liners, a great advantage over the ordinary cast-in cylinders. The centrifugally cast liners of hard-wearing chrome-nickel iron not only give long life, but also a uniform expansion under heat and do not distort when heated. They can be renewed very quickly at small expense—saving the use of over-size pistons.

The cylinder block of nickel iron or of aluminium alloy, is cast integral with the crankcase, and is provided with a large door on the off-side for dismantling the connecting rods and pistons without removing the crankshaft or the oil sump. The cylinder-head is a separate unit of nickel iron and is removable. It carries the rocker shaft and valve mechanism. Ample water passages are provided round the valves and fuel injection nozzle-holder. The pistons are of nickel chromium iron mixture. The overhead-type valves in the cylinder head are of special steel which does not corrode at high temperature. The camshaft is made from a solid forging with the cams integral, the driving-gear end being carried by a heavy-type ball bearing. The camshaft runs in an oil bath.

The crankshaft, supported on three heavy-type roller bearings, is a heat-treated nickel-chrome steel forging of sufficient size and strength to eliminate all possibility of torsional vibration, the end-thrust being taken by the bearing at the flywheel end. The crankshaft is drilled for pressure lubrication to all connecting-rod bearings. Wide-face single helical gears are used throughout, the crankshaft driving pinion being ground and made from nitralloy steel.

A centrifugal governor in automotive-type engines is fitted with suitable control to permit of variations in the engine speed and is combined with the fuel-pump drive, with which is incorporated the company's patented fuel injection timing. Lubrication is by pressure through hollow shafts to every bearing or other moving part, the gear-type oil pump being driven from the crankshaft. The Bosch-type fuel injector is of high efficiency and entirely dependable. Starting is effected by 6 H.P. starter and two 12-volt batteries, which are supplied by 130-watt dynamo.

## EXTENSION OF THE GREAT WESTERN RAILWAY ROAD SERVICES

LARGE PURCHASES OF VEHICLES.

A new transport development is foreshadowed by the Great Western Railway who propose to proceed at once with the purchase of an additional 152 new motor vehicles and tractors to the value of £89,786. These vehicles will be used in connection with the following new cartage developments:—

The expansion of the Company's collection and delivery services as a result of the extension of its free delivery areas due to the growth of housing estates, etc.

The replacement of horses by motors, releasing 115 horses.

The inauguration of new country lorry services, of which 135 are now in operation, and to strengthen certain existing services.

Affording traders cartage facilities for certain lower class traffics consigned by rail at "Station to Station" rates.

Special Rail-Road contracts and throughout road services, especially in London and South Wales, for the conveyance of general building materials, bricks, pipes, girder work, timber, roadstone, etc., required for delivery to site.

The concentration of collection and delivery traffic upon one main station serving a considerable area whereby traffic is expedited and economies in working effected.

The conveyance of livestock to and from markets and shows either in connection with rail services or by road direct. This is the result of a growing demand by farmers for such conveyance, as not only does the cattle arrive in better condition, but owing to the congestion of the roads it is becoming increasingly difficult to walk cattle any distance.

The development of the Company's container traffic, tractors being specially suitable for the work as they enable the trailer to be left at traders' premises for loading or unloading while the tractor is utilised to full advantage.

Despite trade depression the tonnage of traffic collected and delivered by this new method of co-ordinated rail and road services shows an increase of 28,750 tons per month over corresponding periods last year and represents an increase of 53 per cent. or 157,000 tons per month over the 1922 figure.

The G.W.R. may justly claim to be the pioneers in rail-road developments, as it began its first freight lorry services in 1904. Since the war, and especially during the last few years, it has continued to initiate new services and to augment its existing services until to-day there is hardly a square mile of the territory covered by its system that is not also covered by its road services.

The country lorry services, operating over an area of 12 to 15 miles of rail heads, have brought into immediate touch industrial centres and outlying villages with the result that traffic of every description now passes freely and speedily between country districts and big manufacturing towns. These services have also relieved farmers of the necessity of carting their own traffic to or from railway stations and consequently, the roads of unnecessary traffic.

The Company already operate 831 vehicles in connection with its freight cartage arrangements, and during 1929 these vehicles ran 5,137,481 miles and carried 1,861,434 tons of traffic.

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# OMNIBUS AND COACH SECTION

## LONDON'S NEW OMNIBUS PROGRAMME

### LARGE INSTALMENT OF TWO LATEST TYPES.

The success obtained by the two latest types of omnibuses introduced by the London General Omnibus Company is now being followed by a vigorous production policy which will place 1,300 of these vehicles on the streets by April next. They are the ST and LT types, the former having been introduced in the beginning of this year and the latter in August, 1929. Both are being produced by the Associated Equipment Co., Ltd., of Southall, at the rate of ten per week and later twenty per week will be placed in service. At first the new vehicles will replace the old K type, which was introduced in 1919, and by February next these will all have been withdrawn. Afterwards the intermediate types will be gradually superseded, but as the total fleet numbers 4,600, this will take some time.

The London General Omnibus Company's new "L.T." type Six-wheel Vehicle.

Other types which will be in service after the withdrawal of the K early next year include the NS, introduced in 1923, which is still in service in large numbers; and in smaller numbers there remain some of the S type, inaugurated in 1920, and a dozen of the LS, an experimental six-wheel omnibus started at the beginning of 1929. With the exception of the S these are all double-deck covered top vehicles, only the S and some of the NS being on solid tyres. The company have also a number of single-deck omnibuses operating services on special routes where obstructions, low bridges, etc., prevent the use of double-deck vehicles. These include fifty of the T type "Regal."

Lower Saloon of "L.T." Omnibus.

Owing to the large number of intermediate types still in service, it will be impossible to standardise the two latest models for some time, but the new programme shows that there will be a diminution of the intermediate types, and the main patterns will be the ST, LT, and NS, besides the single-deck types.

The two latest types have already been fully described and illustrated in THE TRAMWAY AND RAILWAY WORLD, the ST in the issue of February 13, 1930, and the LT on August 15, 1929, but in view of their success and that production is now being concentrated upon these, a summary of their principal characteristics will be of interest.

In designing the ST type the object was to obtain a higher speed between points and to reduce the time spent at stops. Quick loading and unloading is secured by an enlarged platform, on which six or more passengers can stand before proceeding to either saloon, thus reducing congestion. On this platform also the five passengers permitted to stand during rush hours can be accommodated, leaving the corridor free. The staircase is placed at the offside, and is part of the interior of the vehicle, leading straight up to the top saloon; passengers are thus protected from the weather when using the staircase or standing on the platform. In handling peak hour traffic at congested points this omnibus has proved an unqualified success. It seats fifty passengers, twenty in the lower and thirty in the upper saloon. The seats are super sprung, slightly tilted, with ample space for two passengers on each seat, and are decidedly luxurious. In both saloons the front and rear windows are of unsplinterable glass. The small side windows are in two parts, an upper and a lower, and the upper can be slid up and down at the discretion of the passenger. The electric lighting in both saloons is through curved translucent panels. The body is mounted on the "Regal" chassis of the Associated Equipment Co. It has a 95 H.P. six-cylinder overhead poppet-valve engine. The back axle casing is off-centred, thus effectively reducing the height of the floor of this low-loading vehicle.

The LT type is a six-wheel vehicle designed more for outlying districts where higher speeds are possible than on streets where the traffic is dense. It also has luxurious seating accommodation and takes fifty-four passengers, twenty-four in the lower, and thirty in the upper saloon. Half-drop windows are fitted both upstairs and down, and are under the control of the passengers, and additional ventilation is provided by front ventilators on both decks. In this vehicle the driver was for the first time given the protection of a half cab, the upper deck extending over the canopy of the cab.

The chassis was designed as a high-class fast passenger carrying vehicle. The engine, a new type, is the A.E.C. "Renown" of 95 H.P.

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# OMNIBUS AND COACH SECTION

It has six cylinders, overhead camshaft, and is of 100 mm. bore by 130 mm. stroke. Fan and dynamo are positively driven by timing chains, no belts being used The engine develops 48 B H.P. at 1,000 R.P.M., and 95 B.H.P. at 2,500 R.P.M. Like the ST engine, it is thus much more powerful than those of the older types of "General" omnibuses, and a higher average speed is obtainable owing to greater accelerative and decelerative power. Both hand and foot brakes operate on all four rear wheels, and the foot brake is assisted by a "Dewandre" servo vacuum mechanism permitting extremely good deceleration with a minimum of effort.

L.G.O.C. Omnibus Type T.

Little need be said of the NS type, which will now automatically be replaced by the newer models. For comparison, however, it may be mentioned that the engine of the NS is a four-cylinder of 30 to 45 H.P., and that the vehicle seats fifty passengers. It was this medium powered engine that enabled the L.G.O.C. omnibuses to climb the steep hills encountered in outlying parts of London, and enabled the services to be extended. The new engine of 95 H.P. fitted to the latest omnibuses shows the progress that has been made.

The "Regal" single-deck omnibus is also a very comfortable vehicle and seats thirty passengers. It is built on a patent flexible principle which enables light weight material to be used without sacrifice of strength. Its silent running is an outstanding feature. It has drop windows on the sides, with louvre ventilators above. The engine is a six-cylinder, and with a Treasury rating of 37.2 H.P., the maximum of 95 B.H.P. is attained at 2,500 R.P.M., and at 1,000 R.P.M. the reading is 48 B.H.P. The engine and chassis were evolved to meet the demand for speed with safety, prompt acceleration, trouble-free braking, perfect control in steering, and passenger comfort.

## SOUTH AUSTRALIAN TRANSPORT CO-ORDINATION

The Royal Commission on the co-ordination of rail and road motor transport in South Australia, which was appointed in May last, has issued a first progress report and a draft Bill which it recommends should be made law as speedily as possible. The Bill provides for the appointment of a Transport Board of three members which would co-ordinate and control routes or areas where the railway and road services clash. The Board would have power to close railways and to substitute other forms of transport, and to declare controlled routes. Licences to operate passenger or goods services would be granted for individuals or firms, and not for separate vehicles, the charge being on turnover. The main object of the Bill is to reduce the railway losses by between £100,000 and £200,000 per annum, the amount estimated to be caused by present uneconomic road competition. It does not apply to vehicles operating within ten miles of the General Post Office, Adelaide, except that some control will be exercised over motor traffic competing with the railway to the Outer Harbour. Areas within ten miles of certain country towns will also be exempt when they have been so proclaimed. Instead of establishing control over all motor vehicles plying for hire throughout the State, the plan is to control only those routes or areas where experience shows that control is necessary. Mr. W. G. T. Goodman, chief engineer and general manager of the Adelaide Tramways, is chairman of the Commission.

New London "S.T." Luxury Omnibus with a platform facilitating rapid loading.

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# OMNIBUS AND COACH SECTION

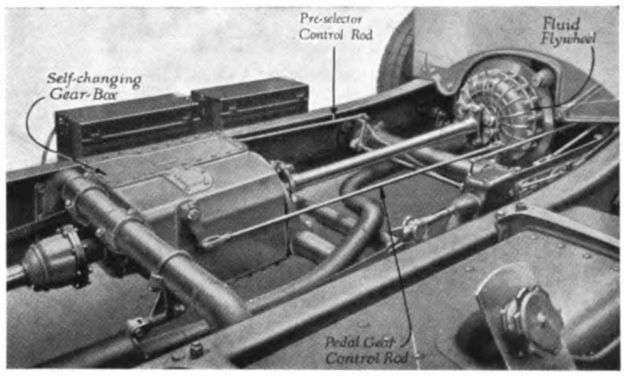
## DAIMLER FLUID FLYWHEEL AND SELF-CHANGING GEAR.

NEW TRANSMISSION NOW AVAILABLE FOR OMNIBUSES.

Demonstrations have lately been given by the Daimler Company, Ltd., in London and elsewhere, of their new transmission system applied to a six-cylinder Daimler double-deck, 50-seat omnibus, the body being built by Park Royal Coachworks, Ltd., London, N.W. It should at once be said that the innovation has proved just as successful as has been the case with Daimler private cars since it was introduced on them three years ago. It promises, indeed, to become another of the epoch-making advances in design associated with the Daimler Company. Notable among these are the silent sleeve-valve engine, its development in 1925 by the substitution of light steel sleeves, the worm-driven rear axle, quieter gears and improved springing. These improvements have given a marked popularity to Daimler long-distance coaches and general service omnibuses, a popularity that cannot fail to be increased by the shockless transmission system.

A chassis thus fitted was a centre of attraction in the public passenger section of the Scottish Motor Exhibition this month at Glasgow. The new transmission comprises the hydro-dynamic shockless device now well known as the Daimler fluid flywheel; a pre-selective, self-changing, silent four-speed gear-box; and the worm-driven rear axle.

The fluid flywheel replaces the clutch, has only two moving parts, and is automatic in action. It is enclosed within a casing secured




Daimler Fluid Flywheel and Self-changing Gear-box.

to the flywheel. The drive is transmitted by means of the inter changes of energy in a rapidly-moving fluid, with the result that starting from rest and "take-up" after gear-changing are infinitely smoother. The vehicle can be started and stopped at will with the drive engaged and the engine running, while the ability to use the engine as a brake is in no way affected. Over-run vibration is entirely eliminated, and there is an entire absence of noise, either when idling, or on any gear.

For use in combination with this flywheel a form of automatic gear changing was sought and all types of gear-box designs were studied, the Wilson self-changing epicyclic type being finally adopted. In combination with the fluid flywheel it was found that gear noise was eliminated, with the ease of operation and automatic changing.

With this combination of fluid flywheel and automatic gear changing it is possible to provide an increased degree of silence, smoothness and ease of operation, driving fatigue being reduced to a minimum. The mind of the driver is freed for the business of driving, by the elimination of clutch-pedal operation and by the simplicity of gear changing. Thus a greater degree of safety is secured to the driver, passengers and the public. The third speed being dead silent can be used continuously in traffic and hilly country, and is in fact intended to be used as a normal gear.

To describe this hydro-dynamic unit more closely, it may be referred to as comprising two independent rotors within a casing, one being the driving and the other the driven member. The faces comprise a large number of pockets or cups. Oil contained within the casing is circulated by the rotation of the driving member, so as to propel the driven member when the engine speed rises to about 600 R.P.M. Until that speed is reached slippage occurs, so that the vehicle remains stationary, despite the engine being in motion. Even if top gear is engaged and no brakes are applied, the vehicle will not move on a level road until the engine exceeds the speed of 600 R.P.M. With the speeding up of the engine the slippage rapidly falls to about 2 per cent. at ordinary speeds. Whichever gear is engaged the vehicle moves off from rest with perfect smoothness. To stop it the driver has only to take his foot off the accelerator pedal and apply the brakes.

Ease of operation is carried a step further by placing a small control lever and indicator on the steering column, in order to effect the gear changes. The lever is within reach of the finger of the right hand while holding the steering wheel. By means of the lever any gear desired may be pre-selected, and be instantly and silently engaged by depressing and releasing a pedal which takes the place of that used for disengaging an ordinary clutch. The self-changing gear-box is self-adjusting and is fool-proof Economy of running in respect of petrol, tyres, brake-bands, etc., result from the use of this transmission, which has the further merit of freeing the passengers from jolting set up by mishandling of the gears. The London General Omnibus Co. has ordered three Daimler chassis equipped with the fluid flywheel.

## LONDON COACH CONGESTION.

THE PROBLEM TO BE INVESTIGATED.

The Minister of Transport has requested the London and Home Counties Traffic Advisory Committee to investigate the increased congestion that has resulted from the growth of long-distance omnibus and coach traffic from and to the provinces and the Metropolis. It is understood that the Minister has asked for recommendations to be submitted before December 31.

Further, it is stated that the police and the Home Office desire that the entry of such vehicles should be prohibited in an area of 1½ miles round Charing Cross. In a little over a year the number of coaches using road sites for taking up and setting down passengers has grown from 600 to more than 1,500, and about 5,000 of these vehicles are entering London daily.

In the annual report of the Advisory Committee for the year ended September 30, 1929, the following paragraph was published:—"The influx of large numbers of coaches into the Metropolis is a matter which is causing some disquietude, and we anticipate that the increasing employment of this type of vehicle will render it necessary at an early date to take steps to ensure that coaches, during their waiting, shall be accommodated off the highway."

OBJECTION BY WESTMINSTER HIGHWAYS COMMITTEE.

A report submitted to Westminster City Council by the Highways Committee stated that Mr. F. Pick, managing director of the London Underground Group, had been good enough to explain to the committee the proposals of the L.G.O.C. in reference to the station for the Green Line coaches which is being constructed in Broad Street, Soho. In anticipation of the withdrawal of the existing facilities for taking up and setting down passengers in the streets, the L.G.O.C. proposes to acquire sites for stations for long-distance omnibuses. The site in Soho is merely one, and the committee believe that others have been, or will be, acquired.

In the opinion of the committee the Broad Street site is unsuitable for an omnibus station, on account of the poor access obtainable along the existing streets to Oxford Street, Regent Street and Shaftesbury Avenue. The proposal of the company will present new traffic problems of great difficulty, and may result in Westminster City Council having to spend considerable sums on street improvements in the area.

It would seem desirable, the committee adds, that the Traffic Advisory Committee, which is the main traffic authority for the London area, together with the omnibus companies concerned, should at once consider this question and decide what steps should be taken to prevent the congestion which must arise if coach stations are set up in the centre of Westminster. The committee recommends that the attention of the Ministry of Transport be drawn to the proposed station and to the possible damaging effect on local interests and the obstruction and delay of traffic that may arise from the proposal, and that the Ministry be asked to consider whether steps should be taken to prohibit the placing of such stations in the central area of London.

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# OMNIBUS AND COACH SECTION

## BY OMNIBUS FROM MANCHESTER TO PARIS.

A Crossley Double-Decker the Centre of Interest.

At the annual conference of the Municipal Tramways and Transport Association M. F. de Lancker, President of the International Tramways and Light Railways Union, who had come specially from Brussels to attend the conference, invited British tramway managers to attend a special meeting to be held in Paris in October to consider the scheme of regenerative control and braking of tramcars which the Paris Transport Company have introduced. The invitation was accepted by a number of managers, and Mr. R. S. Pilcher, president of the Municipal Tramways and Transport Association and general manager of Manchester Corporation Transport, at once proposed that the British delegates should travel to Paris in an omnibus which was placed at his disposal by Crossley Motors, Ltd., and is shortly to be delivered to Manchester Corporation. Parisians were thus given an opportunity to see in operation on their boulevards, streets, and squares an example of one of the latest types of British-built omnibuses, and to compare it with the somewhat primitive vehicles in service in Paris.

Lifting the Omnibus on Board at Dover

The Crossley omnibus, seating 50 passengers, left Manchester on Thursday morning, October 16, and arrived in London in the evening. On the following day with an increased party it left the Waldorf Hotel about 7 a.m. and ran via Maidstone and Canterbury to Dover, where it arrived about 11 a.m. There another Crossley omnibus was waiting on the quay. Its transfer to the special boat was quickly effected, and in fine weather the Channel was crossed without incident. At Calais a landing was made at the quay opposite the familiar Gare Maritime and in a few minutes, the omnibus having been lifted from the boat by a modern electric crane, the party were conveyed to a restaurant for luncheon. Afterwards the run to Amiens was begun, and, travelling at times at about 40 miles per hour, the journey was comfortably made with some intermediate stops. A halt for the night was made at the Grand Hotel at Amiens, where the party had the opportunity on the following morning of visiting the cathedral and an extensive motor garage consisting of several floors which is in course of construction. The journey was then continued to Beauvais, near which the party saw the tangled mass of metal which is all that remains of R101. After luncheon the omnibus proceeded to Paris, which was reached about 5 o'clock. A tour of some of the principal streets and boulevards was then made, and the omnibus everywhere attracted great attention. Much curiosity was exhibited by the crowds which quickly gathered whenever a stop was made. The Crossley omnibus was the first enclosed double-decker to be seen in Paris, and it is gratifying to mention that the Paris authorities gave every assistance and issued special permission for the omnibus to run. The Automobile Association and the Federation of British Industries also co-operated in making special arrangements for the trip.

Lowering the Crossley on the Boat

Passing through a French Village

Throughout the visitors' stay in Paris the omnibus was used for transport, and wherever it appeared the people showed the same

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# OMNIBUS AND COACH SECTION

interest. The top-covered vehicle with its brilliant colouring of red and cream with gold lines, formed a striking contrast to the single-deck green omnibuses with which the Parisians are familiar. Several articles appeared in the newspapers discussing the

The Omnibus attracts Parisian Curiosity

advisability of the use of double-deck omnibuses in Paris, and it is quite possible that the effect created by the smooth and rapid movement of the omnibus, its luxurious seats and comfortable riding, may lead to some development on the part of the Paris undertaking. The party attended the meeting of the International Tramways Union and remained in Paris until October 22, when

The Omnibus and the British Delegation outside Versailles

they returned to Calais by train. The omnibus which had preceded them was ferried to Dover, the crossing again being made in splendid weather, and the return to London was completed by omnibus the same evening.

The British delegates who attended were as follows :—

R. Stuart Pilcher, president of the Municipal Tramways and Transport Association and general manager of Manchester Corporation Transport Department.
Ald. A. G. Ellaway, vice-president of the Municipal Tramways and Transport Association and vice-chairman of Birmingham Corporation Tramways Committee.
J. Beckett, general secretary, Municipal Tramways and Transport Association.
A. C. Baker, general manager, Birmingham Corporation Tramways and Omnibus Department.
Wm. Forbes, general manager, Cardiff Corporation Tramways Department.
P. Ellison, general manager, Eastbourne Corporation Motor Omnibus Department.
W. R. Elliott, general manager, East Ham Corporation Tramways.
R. McLeod, deputy transport manager Edinburgh Corporation Transport.
J. C. Williams, general manager, Erith Corporation Tramways.
L. Mackinnon, general manager, Glasgow Corporation Transport.
H. Gerrard, engineer, Glasgow Corporation Transport.
A. A. Blackburn, general manager, Huddersfield Corporation Tramways.
L. E. Harvey, general manager, Ilford Corporation Tramways.
Geo. Rock, general manager, Lincoln Corporation Tramways.
John F. Cameron, general manager, Northampton Corporation Tramways.
W. G. Marks, general manager, Nottingham Corporation Tramways.
Ben Hall, general manager, Portsmouth Corporation Tramways.
S. Parsons, general manager, Ramsbottom Urban District Council Tramways.
C. L. E. Stewart, general manager, Rawtenstall Corporation Tramways.
J. S. D. Moffett, general manager, Salford Corporation Tramways.
P. J. Baker, general manager, Southampton Corporation Tramways.
W. Vane Morland, general manager, Walsall Corporation Tramways.
Councillor Adam M. Millar, convener, Edinburgh Transport Committee.
Bailie P. J. Dollan, convener, Glasgow Transport Committee.
Councillor I. Brassington, chairman, Manchester Transport Committee.
Councillor T. H. Adams, member, Manchester Transport Committee.
W. W. Adam, Breda Electrical Co., London and Milan.
G. H. Fletcher, chief engineer and manager, Traction Motor Works, Metropolitan-Vickers Electrical Co., Ltd., Sheffield.
H. J. Ferguson, "Electric Railway, Bus and Tram Journal," London.
A. W. Hubble, managing director, Crossley Motors, Ltd.
J. M. Manclark and J. Manclark, Jnr., Edinburgh.
W. T. Robson, Equipment and Engineering Co., Ltd., London.
W. A. Stevens (Associated with Guy Motors, Ltd.), Maidstone.
H. E. Townell, J. W. Courtenay, Ltd., London.
A. M. Willcox, The Tramway and Railway World, London.

## THE SPEED LIMIT FOR PUBLIC VEHICLES.

Sir George Penny asked the Minister of Transport in the House of Commons on November 6, whether, in view of the high speed at which many of the heavy passenger coaches are driven on the roads, he would make it compulsory for a schedule time record of each journey to be made by the driver, both as a protection to the public and to provide evidence should it be required in case of accidents.

Mr. Herbert Morrison replied : Sub-sections (3) and (5) of Section 72 of the Road Traffic Act, 1930, provide for the submission to the Traffic Commissioners of time-tables or of other particulars as to the times to be taken on the journeys, and the Commissioners are required to refuse road service licences if, from the particulars deposited, it seems likely that the speed limit applicable to the vehicle will be contravened. It will be for the Traffic Commissioners to consider whether in certain cases the maintenance of a time-record should be made a condition of the grant of a road service licence.

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# OMNIBUS AND COACH SECTION

## THE NEW TRAFFIC AREAS.

### As Defined by the Road Traffic Act, 1930.

Part IV of the Road Traffic Act, 1930, relating to the three classes of public service passenger vehicles, provides for the formation of thirteen traffic areas in Great Britain, including the Metropolis. These areas are given below, together with the towns in which the headquarter offices are to be situated:—

| District | Office | District | Office |
|---|---|---|---|
| Northern .. | Newcastle-on-Tyne. | Eastern .. | Cambridge |
| | | Western .. | Bristol. |
| Yorkshire .. | Leeds. | Southern .. | Reading. |
| North-Western | Manchester. | South-Eastern | London. |
| West Midland | Birmingham | Metropolitan | London. |
| East Midland | Nottingham. | Northern .. | Aberdeen. |
| South Wales | Cardiff. | Southern .. | Edinburgh. |

For each area, except the Metropolitan, there will be a body of three Commissioners whose duty it will be to issue licences under Part IV and to exercise such other powers and perform such other duties as are conferred or imposed upon them by the Act, and subject as aforesaid they will act under the general directions of the Minister of Transport. For the Metropolitan area there will be one Commissioner only. In each of the other areas a chairman of the Commissioners will be appointed by the Minister. The two others will be appointed by the Minister from panels of nominations by the County Councils of each area and by county boroughs and urban districts.

The Minister hopes that by the end of November the Commissioners will have been appointed, but they will not begin to licence, regulate and co-ordinate public vehicles until April 1.

The subjoined list shows the constitution of the traffic areas:—

ENGLAND AND WALES.

NORTHERN.—The administrative counties of Northumberland, Cumberland, Durham and Westmorland. So much of the administrative county of Lancaster as comprises the urban districts of Dalton-in-Furness, Ulverston, and Grange, and the rural district of Ulverston; so much of the administrative county of York, North Riding, as comprises the boroughs of Richmond, Thornaby-on-Tees, and Redcar and the urban districts of Northallerton, Guisborough, Eston, Skelton and Brotton, Saltburn, Loftus, Hinderwell and Whitby and the rural districts of Northallerton, Croft, Richmond, Middlesbrough, Stokesley, Guisborough and Whitby. The county boroughs of Newcastle-on-Tyne, Tynemouth, Carlisle, Darlington, Gateshead, South Shields, Sunderland, West Hartlepool, Barrow-in-Furness, and Middlesbrough.

YORKSHIRE.—The administrative counties of York, North Riding (except the portion included in the Northern Traffic Area), York, West Riding, and York, East Riding; so much of the administrative county of Derby as comprises the borough of Chesterfield, the urban districts of Dronfield, Baslow and Bubnell, Bolsover, Clay Cross, and Brampton and Walton, and the rural districts of Chesterfield, Norton, Clown, and Blackwell. The county boroughs of Kingston-upon-Hull, York, Barnsley, Bradford, Halifax, Dewsbury, Doncaster, Huddersfield, Leeds, Rotherham, Sheffield and Wakefield.

NORTH-WESTERN.—The administrative counties of Montgomery, Merioneth, Carnarvon, Anglesey, Denbigh, Flint, Chester and Lancaster (except the portion included in the Northern Traffic Area); so much of the administrative county of Derby as comprises the boroughs of Buxton and Glossop, the urban district of New Mills, and the rural districts of Chapel-en-le-Frith, Glossop Dale, and Hayfield. The county boroughs of Birkenhead, Chester, Stockport, Wallasey, Blackburn, Blackpool, Bolton, Bootle, Burnley, Bury, Liverpool, Manchester, Oldham, Preston, Rochdale, St. Helen's, Salford, Southport, Warrington, and Wigan.

WEST MIDLAND.—The administrative counties of Hereford, Salop, Stafford, Warwick, and Worcester. The county boroughs of Burton-upon-Trent, Smethwick, Stoke-on-Trent, Walsall, West Bromwich, Wolverhampton, Birmingham, Coventry, Dudley, and Worcester.

EAST MIDLAND.—The administrative counties of Nottingham, the parts of Lindsey, the parts of Kesteven, the parts of Holland, Rutland, Leicester, Northampton, Huntingdon, Bedford, and the Soke of Peterborough. The administrative county of Bucks (except the portion included in the Southern Area). The administrative county of Derby (except the portions included in the Yorkshire traffic area and the North-Western traffic area). The county boroughs of Nottingham, Grimsby, Lincoln, Leicester, Northampton, and Derby.

EASTERN.—The administrative counties of Norfolk, the Isle of Ely, Cambridge, East Suffolk, and West Suffolk, so much of the administrative county of Essex as lies outside the Metropolitan Police District; so much of the administrative county of Hertford as lies outside the Metropolitan Police District. The county boroughs of Great Yarmouth, Norwich, Ipswich, and Southend-on-Sea.

SOUTH WALES.—The administrative counties of Pembroke, Cardigan, Carmarthen, Brecon, Radnor, Glamorgan, and Monmouth. The county boroughs of Cardiff, Merthyr Tydfil, Swansea, and Newport.

WESTERN.—The administrative counties of Cornwall, Devon, Somerset and Gloucester. The county boroughs of Exeter, Plymouth, Bath, Bristol, and Gloucester.

SOUTHERN.—The administrative counties of Oxford, Berks, Wilts, Dorset, Southampton, and the Isle of Wight. So much of the administrative county of Bucks as comprises the borough of Chepping Wycombe, the urban districts of Beaconsfield, Marlow, and Slough, and the rural districts of Eton, Wycombe, and Hambledon. The county boroughs of Oxford, Reading, Bournemouth, Portsmouth, and Southampton.

SOUTH-EASTERN.—The administrative counties of East Sussex and West Sussex; so much of the administrative counties of Surrey and Kent as lies outside the Metropolitan Police District; the county boroughs of Brighton, Eastbourne, Hastings, and Canterbury.

METROPOLITAN.—The Metropolitan Police District and the City of London.

SCOTLAND.

NORTHERN.—The counties of Caithness, Sutherland, Ross and Cromarty, Inverness, Nairn, Moray, Banff, Aberdeen, Orkney, Zetland, Kincardine, Perth, Angus, Clackmannan, Kinross and Fife.

SOUTHERN.—The counties of Argyll, Stirling, Dumbarton, Renfrew, Lanark, Ayr, Wigtown, Kircudbright, Bute, Westlothian, Midlothian, East Lothian, Berwick, Peebles, Selkirk, Dumfries, and Roxburgh.

## GLASGOW OMNIBUS DEVELOPMENT

Councillor P. J. Dollan, Convener of the Glasgow Transport Committee, speaking at the annual dinner of the department on October 9, expressed his confidence that the neighbouring counties and burghs would co-operate with them in the development of the omnibus services as they had done with the tramway system. Already Lanarkshire, Renfrewshire, Rutherglen and Clydebank had given permission for the omnibus services to be extended to their areas. Referring to the "serious situation" created by the throwing out by the House of Lords Committee of the provision in the Corporation Bill for manufacturing omnibus bodies, he expressed a hope that the proposal to form a company of members of the Committee would be found in order. He was convinced that a scheme of traffic co-ordination similar to that proposed for London was inevitable in the Clyde area.

The dinner followed the annual inspection, when a visit was paid to the new garage at Larkfield, built at a cost of £60,000, and accommodating 175 double-deck omnibuses, and the Coplawhill car works were also visited. A garage to hold 200 omnibuses is about to be built at Anniesland, and sites for other garages are being prospected. At present the Corporation has 250 omnibuses.

LUMINOUS SIGNAL FOR OMNIBUSES AND COACHES.—The General Electric Co., Ltd., Magnet House, Kingsway, London, has introduced a luminous signal which gives warning of the intention of an omnibus or coach driver to stop. A passenger wishing to alight presses one of the bell pushes, thus illuminating a "stop" light by the side of the driver and a rear "stopping" light. To start the vehicle again the conductor operates a device that extinguishes the two lights and indicates to the driver that he can proceed.

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# OMNIBUS AND COACH SECTION

## OMNIBUS AND COACH SERVICES.

### MUNICIPAL.

NEWCASTLE AND DOUBLE-DECK OMNIBUSES.—Single-deck omnibuses run within the city by the Tramways Department are being replaced by double-deck vehicles.

GRANTED FOR THREE MONTHS.—Manchester Watch Committee has sanctioned for three months a proposal by the Transport Committee to operate an omnibus service along Oldham Road and Butler Street.

INSTRUCTION OF GLASGOW DRIVERS.—The Corporation Transport Department is to construct a concrete track at the extended Larkfield garage for the instruction of omnibus drivers. This innovation will save much time, and will obviate the necessity of using the streets.

GARAGE ACCOMMODATION AT DUNDEE.—The Corporation Transport Committee has approved the plans submitted by the city engineer for the enlargement of the depot at Lochee Road by the addition of garage accommodation, including petrol filling, omnibus washing and a brake-testing platform.

OMNIBUSES FOR TEES-SIDE.—A joint committee of Stockton and Middlesbrough Corporations has arranged for a service of omnibuses to be started between Middlesbrough and Stockton Town Halls, also between the two towns along the Acklam route, the services to be operated jointly. Each Corporation has purchased six omnibuses to be used on these services.

INCREASED SERVICE AT GLOUCESTER.—It has been decided by Gloucester Transport Committee to continue the Sunday services on all omnibus routes, to increase the services between King's Square and Elmbridge Road, and to provide omnibuses to and from Barton Fair Ground, the deputy-mayor and Councillors Colborn and Elias being empowered to obtain the necessary omnibuses.

MORE GLASGOW SERVICES.—Glasgow Transport Committee are planning omnibus services into Renfrewshire, including Giffnock, Busby, Clarkston, Mearnskirk, and Newton-Mearns. The King's Park services are also to be extended over the Lanarkshire boundary. Permission has been received from both county councils. Rutherglen and Clydebank have given permission for services to be extended to their areas.

GLASGOW EMPLOYEES' WAGES.—Drivers and conductors on the Corporation omnibuses have asked that the scale of 60s. to 66s. per week for drivers should be raised to 74s. to 80s., and for conductors from 55s.-60s. to 65s.-70s. The application would, it is estimated, entail an annual addition of £60,000 to the wages bill. It has been referred to the manager and to the Wages and Conditions of Service Committee.

THE SECOND CHANGE-OVER AT MANCHESTER.—The City Council has approved the scheme of Mr. Stuart Pilcher, general manager of the Transport Department, and recommended by the Transport Committee, to substitute omnibuses for the tramway from the city boundaries to Altrincham, about eight miles. Double-deck vehicles carrying 50 passengers were introduced on November 2. Sanction has been received to borrow £39,200 for the purchase of thirty omnibuses.

EMERGENCY EXITS ON GLASGOW OMNIBUSES.—Three emergency exits are provided to the double-deck bodies built on A.E.C. Regent chassis for Glasgow Corporation. Two of the exits are on the top deck. One is a large window to the rear of the fully-enclosed staircase. The other is provided by half of the front bulkhead swinging outwards. Like a wide door in the lower saloon just to the rear of the driver, the latter exit can be operated inside or outside the omnibus.

DARLINGTON'S WORKING COSTS.—At Darlington Town Council, Alderman Sir C. W. Starmer, chairman of the Transport Committee, said that during the past year the omnibuses carried about 10,000,000 passengers, being 800,000 more than in any of the past four years and twice as many as six years ago. The revenue increased only from £49,000 to £51,000, owing to reduced fares. The revenue per omnibus mile was 13·5d., and the working costs 9¾d., which he believed was the lowest in the country. The profit on the trolleybuses was £4,922, but there was a loss of £1,186 on the petrol omnibus services.

CARDIFF COUNCIL AND R.O.P. PETROL.—Cardiff Tramways Committee has again considered the tender of Russian Oil Products for petrol, which had been referred back by the Council. The price quoted was 10⅛d. per gallon, which for the total of 75,000 gallons, was £1,577 below the lowest combine tender and £9,194 less than for the same quantity last year. It was decided that for a month the manager should purchase in the open market, and the question will be decided at the next meeting. During the discussion Mr. W. Forbes, general manager of the department, stated that the rebate of 2⅝d. per gallon on the amount required by the department was a fixture, whatever the market price might be.

EXPANSION OF CARDIFF SERVICES.—It was decided by Cardiff Tramways Committee on October 13 to obtain tenders for six single-deck omnibuses, and in view of the improving financial position to charge the outlay to revenue during a period of five years. In the six months ended September 30 the receipts had increased £19,588, and the traffic expenses by £6,832. The number of omnibuses in daily commission rose from 66 to 80. Commenting on the foregoing figures the *Western Mail* remarks that "in years gone by, objection was raised to proposals to change over from tramcar to omnibus on the ground that the latter could not cope with the exceptional pressure of traffic in what are called the rush hours, but the conversion which has been made on the Cathays route shows the objection to be invalid."

### COMPANY.

RAILWAY APPLICATIONS GRANTED.—Four omnibus licences have been granted at Chorley to the L.M.S. and L.N.E. Railway Companies.

NEW GARAGE AT TORQUAY.—Workshops and a garage are being erected in Newton Road, Torquay, by the Devon General Bus and Touring Co.

SPECIAL BLACKPOOL TRAFFIC.—On the opening day of the illuminations by which Blackpool extends its season, it is estimated that 1,500 coaches entered the town.

EXTINGUISHERS TO BE CARRIED.—Plymouth Watch Committee has made it a condition of licensing double-deck omnibuses that at least two fire extinguishers are provided in each vehicle.

SAFETY RAIL AT EXIT.—Blyth Licensing Committee has asked the borough engineer to confer with the owners of double-deck omnibuses on the question of the provision of a safety rail at the exit.

CO-ORDINATION IN SCOTLAND.—As a beginning in the co-ordination of rail and road services, the omnibuses of the Scottish General Co., and of Messrs. Alexander, now operate to and from Stirling station.

OBSOLETE OMNIBUSES.—Owners of obsolete types of omnibuses at Stoke-on-Trent have been informed by the chief constable that unless such vehicles are replaced the Watch Committee will consider withdrawing the licences.

NEW OMNIBUSES AT CHATHAM.—The Medway Traction Co., has ordered 51 Leyland double-deck omnibuses, which will traverse the old Chatham-Rochester-Gillingham tramway routes. It is intimated that there may be a slight increase in the fares on certain routes.

L.G.O.C. MEN RE-ENGAGED.—The London General Omnibus Co. has been able to reinstate the 250 men who had become surplus this winter. The Union consented to a 40-hour guaranteed week of five days, instead of the 48-hour guaranteed week previously in operation.

WEST YORKSHIRE ROAD CAR CO.—The fleet of this company, which has headquarters at Harrogate, now comprises over six hundred vehicles. During the year the company has acquired the Cosy Car Service and the Ebor Services, which operate extensively in the York area. A new depot is to be erected at York.

REDUCTION IN FARES SUGGESTED.—At the October meeting of Woking Urban Council complaint was made that some fares were excessive. It was decided to write to the proprietors in the area to inquire why there had been no reduction in fares since the fall in the price of petrol, as when there was an increase in price the fares were raised.

ADDITIONAL U.A.S. LICENCES.—Ripon Watch Committee has granted the application of the United Automobile Services, Ltd., for the licensing of thirty-eight additional vehicles. Licences to "outsiders" are now to be issued only in respect of vehicles for which a certificate of efficiency for the hackney carriage licences of their respective areas is produced.

STIPULATION AS TO SEATING CAPACITY.—On condition that Ribble Motor Services use omnibuses with a seating capacity not exceeding twenty passengers, Chorley Watch Committee has renewed the licences for a service from Chorley Heath to Horwich. The licences

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# OMNIBUS AND COACH SECTION

had been refused, as the Committee considered that the type of omnibus in use was not suitable for the roads.

DAIMLER OMNIBUSES REPLACE TRAMWAYS.—Lanarkshire Traction Co. has discontinued its tramway services on the greater part of its routes, and replaced them by fifty Daimler omnibuses on CF6 chassis. It is anticipated that one hundred additional vehicles will be required. The bodies, which seat 32, are by the Hoyal Body Corporation. Eventually the whole of the forty-two miles of tramways will be scrapped.

PREMIER LINE, LTD.—A private company with this title has been registered, with a nominal capital of £60,000 in £1 shares, to adopt an agreement with the Premier Omnibus Co., Ltd., and to carry on a coach and omnibus business. The office is at 2, Leysfield Road, London, W.13. Among the directors are Captain P. Musker (chairman), Captain Sir C. B. W. Magnay, Sir G. H. U. Lacon, Messrs. W. Allen, A. J. Schiffer, and F. C. Schiffer.

OBJECTION TO REDUCED SERVICE —On the recommendation of the North-East Coast Regional Advisory Committee on Traffic Control, Tynemouth Watch Committee has informed the three companies, and Newcastle Corporation, who operate the service between North Shields and Newcastle, via the coast road, that unless they continue it at the times agreed upon, the Tynemouth Council will make other arrangements. The companies had proposed to curtail the service.

BRINGING TRAFFIC TO THE BRIGHTON RAILWAY.—Brighton Corporation has permitted the extension, until January 31 next, of the Southdown Company's service from Peacehaven to Brighton railway station. The Southdown Services are associated with the Southern Railway, and it was remarked at the Council meeting that the latter company wanted to get the omnibus passengers straight through to the railway. At present the passengers break the journey at the Aquarium.

TRANSFERENCE OF RAILWAY OMNIBUS MEN.—Gradually the railway omnibus staffs are being placed under the control of one or other of the omnibus companies associated with the railway companies. Attempts have been made in some instances, says the *Railway Review*, to secure the transfer under some methods not altogether in the spirit that animated the joint efforts of the companies and the National Union of Railwaymen to secure road transport powers. Prompt action by the union has prevented this, and agreements in a regularised manner are being sought.

COMBINATION IN THE MANCHESTER DISTRICT.—A big scheme for the merger of coach services in Manchester and Salford is proposed, in view of the Road Traffic Act coming into operation. About seventeen companies are concerned in the scheme, in which it is expected that thirty proprietors will eventually join. The merger will affect administrative control only, with the object of economising and eliminating unnecessary services. If the scheme is successful at the outset, it is proposed to reorganise the combine as a public company. Consideration is to be given to the erection of a large central station in Manchester with similar stations in the suburbs.

### LONG-DISTANCE.

BRADFORD-MORECAMBE SERVICE.—B. & H. Tours, Ltd., have been granted licences for a service between Bradford and Morecambe.

FROM WALES TO LONDON.—Cheltenham Watch Committee has granted the application of Cliff, Ltd., for five omnibus licences for their service between London and Llanelly.

THE MIDLANDS TO LOWESTOFT.—Newmarket Urban Council has referred to the Town Committee an application by Messrs. Allchin, of Northampton, for twelve licences on a service between the Midlands and Lowestoft.

SERVICES RUNNING THROUGH NEWBURY.—Licences have been granted by Newbury Watch Committee to the International Express Services, of Sheffield; Underwood Express Services, of Southsea; and Mr. J. Prothero, of Beedon.

A NEWCASTLE DEVELOPMENT.—Orange Bros., of Bedlington and Newcastle, are to erect a new garage and offices near their present premises at Vulcan Place. The additional accommodation is required for an extension of their services to Scotland, as well as for the growth of the service to London.

BOURNEMOUTH'S PRE-EMINENCE.—Elliott Bros. (Bournemouth) Ltd., are continuing all their summer services. From that town alone there are twenty-six coaches daily to London, the Midlands and the North. A new service has lately been started from Bournemouth and Plymouth to Derby and Nottingham.

THE "SCOTTISH EXPRESS."—For their London, Edinburgh and Glasgow service, instituted early in the present year from the Central London Station, National Coachways, Ltd., have ordered a number of 26-seat Daimler coaches, with an observation compartment at the rear. The bodies are by the Hoyal Body Corporation.

NEW SERVICES TO OXFORD.—Mr. F. H. King, of London, has been granted six omnibus licences by Oxford Watch Committee for a service operating from London to Oxford. Sanction has been given to an application by Ensign Motor Coaches for licences to ply for hire in the city on the route from London to Aberystwyth.

LEYLANDS FOR LONG-DISTANCE WORK.—For their services from Liverpool to London and other places the Crosville Co. has acquired a number of Tiger models from Leyland Motors, Ltd. The body seats 22 in armchairs having double-sprung cushions. There is a centre-sliding roof. Triplex glass is used for the driver's cab and the front windows.

WINTER SERVICES.—With the advent of October the long-distance omnibus services in most cases have been reduced to two a day. A few have been withdrawn until next spring. Fares in some instances have been lowered, but not in the case of services to Scotland from London. The chief stations in London find it profitable to continue their advertising, for it is at this time of the year that services working from a station gain the advantage. Prospective travellers who telephone or visit the inquiry office are certain to find that their requirements can be satisfied. The purely pleasure traffic has almost ceased, though in some instances Sunday trips secure patronage. More than one commodious private station has been converted for the winter into a miniature golf centre.

OLDHAM LICENSING CONDITIONS.—A licence has been granted by Oldham Watch Committee to M. & H. Motors, of Blackpool, to operate an Oldham-Blackpool service in conjunction with an existing service by Mr. J. H. Robinson, of Oldham, subject to the fares being 100 per cent. in excess of the Corporation tramway and omnibus services. Mr. W. Riding, Blackpool, the Central Garage Co. of Uppermill, Onward Motors of Hyde, and M. & H. Motors of Blackpool, have been granted omnibus licences at Oldham, subject to their vehicles plying for hire in connection with journeys that are not regularly scheduled services running on defined routes, so that the licensees shall only convey passengers whose seats are booked in conjunction with proprietors of omnibuses who are licensed in the borough.

## RIVALRY WITH MONTE VIDEO TRAMWAYS.

Presiding at the annual meeting of the Atlas Electric and General Trust on November 6, Mr. W. Sandford Poole said that the company owned the entire capital stock of La Sociedad Comercial de Monte-Video which had absorbed the Transatlantica Company, and, with the exception of a small amount, the whole of the debentures of and loans to that company. For three months from the acquisition in January, 1927, the companies showed a return at a rate of over 6½ per cent. per annum. Then omnibuses began to appear on the streets of Monte Video, and within twelve months nearly 500 were operating. The number was now about 400. Unfortunately the municipality encouraged the competition and effectively prevented the tramway company from running omnibuses by stipulating that no one proprietor should own more than three. And whereas the tramcars had to run continuously and to a fixed schedule, the omnibuses were allowed to run at rush hours when full loads were obtainable and to be withdrawn at slack hours. The tramways were also prejudiced by a heavy increase in the contributions for paving of streets which had not previously been paved and the repaving of others, an obligation which was not extended to the proprietors of omnibuses, who were free from any special taxation in connection with the upkeep of roadways. For the year to March 31, 1930, the tramways showed an operating profit of £179,722, an increase of £60,912. There was a saving in operating expenses of £35,000, notwithstanding the increased cost of coal. It was deplorable that nearly the whole of the substantial operating profit was required to meet paving, depreciation and amortization charges. The question of the introduction of further economies was now the subject of special investigation. From the profits on their other holdings the board propose that a final dividend of 3 per cent. be paid on the ordinary shares, making 5 per cent. for the year, leaving £35,122 to be carried to next year's account.

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# OMNIBUS AND COACH SECTION

## SOME RECENT ORDERS.

DENNIS BROS., LTD., have supplied a motor utility tender to East Ham Corporation.

TORQUAY WATCH COMMITTEE has obtained a motor fire engine from Leyland Motors, Ltd.

OXFORD WATCH COMMITTEE has purchased a special low load line 50 H.P. fire engine from Dennis Bros., Ltd., at £1,350.

GLASGOW CORPORATION has ordered 25 "Emperor" double-deck omnibus chassis from the Vulcan Motor and Engineering Co.

HULL TRAMWAYS COMMITTEE has purchased four Dennis omnibuses at £1,587 each and four Leyland omnibuses at £1,650 each.

MERTHYR CORPORATION has accepted the tender of Leyland Motors, Ltd., for the supply of four omnibuses at £1,292 15s. each.

SOUTHEND CORPORATION has placed an order with Dennis Bros., Ltd., for a low load-line 50-H.P. fire engine with first aid apparatus and ladder.

CROSSLEY MOTORS, LTD., have placed an order for a Luchard H.8 high-pressure air compressor for inflating giant pneumatic tyres, with the Equipment and Engineering Co., Ltd.

BURY CORPORATION accepted tenders for four double-deck omnibuses—two Leyland, one Crossley, and one A.E.C. chassis, and four bodies from the Brush Electrical Engineering Co., Ltd.

EAST HAM WORKS COMMITTEE has approved plans submitted by Mr. R. Slater, architect, of a garage and petrol pump with 1,000 gallon underground tank to be erected in Langdon Road.

BRISTOL WATCH COMMITTEE recommended acceptance of the tender of Leyland Motors, Ltd., for the supply of a motor fire engine at £1,740 and the purchase of two pneumatic-tyred Dennis gully emptiers at £1,220 each.

RANSOMES, SIMS & JEFFERIES, LTD., have an order for 25 saloon bodies for Green Line Coaches, Ltd., Westminster, for their "Regal" express omnibuses. These bodies will seat thirty passengers, all facing forward.

J. I. THORNYCROFT & CO., LTD., have a repeat order from Bournemouth Corporation Tramways Department for twelve 32-seat omnibuses. The vehicles are to be used for express services, in extension of those which were inaugurated with twelve omnibuses in June last.

HALLEY MOTORS, LTD., have an order from Glasgow Corporation for six Halley 2-ton chassis. These chassis will be fitted as tower wagons. Repeat orders have been received for a 5-ton chassis from S. Alsopp & Sons, Ltd., of Burton, and for a 2½-ton chassis for Glico-Petroleum Co., Ltd.

DERBY TRANSPORT COMMITTEE recommended that Austin cars be adopted as the standard car for the Corporation departments. They recommend the Council to make an agreement with the Dunlop Rubber Co., Ltd., for the maintenance of tyres in use on the Corporation's omnibuses on a mileage basis.

LIVERPOOL CORPORATION has given an order for nine "Emperor" double-deck omnibus chassis to the Vulcan Motor and Engineering Co. This is a repeat order. From the same company Liverpool has ordered nine "Prince" single-deck omnibuses. The Corporation has had one omnibus of this type on test for six months.

WALSALL TRANSPORT COMMITTEE accepted tenders from the Associated Equipment Co., Ltd., and Dennis Brothers, Ltd., for the supply of double-deck motor omnibus chassis, and from the Brush Electrical Engineering Co., Ltd. of Loughborough, Short Brothers, Ltd., of Rochester, and J. C. Beadle, Ltd., of Dartford, for double-deck omnibus bodies.

ABERDEEN TOWN COUNCIL were recommended by the Tramways Committee to place a contract for fourteen double-deck omnibus bodies with the Northern Counties Motor & Engineering Co., Wigan, at £675 per body. The tender of Mr. W. Walker, Aberdeen, was £750 each, or £1,050 more for the total. The recommendation was rejected in favour of an amendment accepting Mr. Walker's offer.

SOUTH SHIELDS CLEANSING COMMITTEE has inspected two low-loading refuse collectors, one manufactured by the Karrier Motor Co. (2½ tons, petrol driven), and the other by Electricars, Ltd. (2 tons, electrically driven). The borough engineer is to report on the prices and respective running costs of the two vehicles. The Committee has accepted the tender of Electricars for the supply of an electric vehicle battery at £225.

THE ASSOCIATED EQUIPMENT CO., LTD., has received the following orders for passenger vehicles: "Regent" double-deck, Thomas Tilling, Ltd. (62); "Regal" single-deck, W. Salisbury & Sons, Ltd. (6), F. J. Smith, Huddersfield Corporation (7), Rhondda Trams (6), Thos. Tilling, Ltd. (12). Overseas orders: Agar Cross and Co., Ltd., Buenos Aires, "Ranger" single-deck; Copenhagen Tramways, Denmark, "Renown" six-wheel double-deck. Many of the above are repeat orders.

CARDIFF TRAMWAYS AND R.O.P. OIL.—Cardiff Tramways Committee again considered the tender of Russian Oil Products for petrol, which had been referred back by the Council. The price quoted was 10⅞d. per gallon, which for the total of 75,000 gallons, was £1,577 below the next lowest combine tender and £9,194 less than for the same quantity last year. It was decided that for the next month the manager should purchase in the open market before the question is finally decided.

THE VULCAN MOTOR AND ENGINEERING CO., have received orders for refuse wagons from Mirfield Urban Council, Stoke-on-Trent, Widnes and Perth Corporations, the War Office (11 six-wheelers), Maesteg Council, and Oxford County Council (10 vehicles). Goods lorries have been ordered by Wigan, Bolton, Swansea, Wallasey, Ilkeston and Blackpool Corporations, Bexley, Otley, and Littleborough Urban Councils, and the Anglo-American Oil Co. For ambulances orders have been received from Oldham and Warrington Corporations. Most of the foregoing orders were "repeat," in some instances two, three and four vehicles being ordered.

## MOTOR TRAFFIC NOTES.

SPEED LIMITS FOR BERLIN OMNIBUSES.—Berlin omnibuses on pneumatic tyres are to be limited to a speed of 25 M.P.H., and those on solid rubber tyres to 19 M.P.H.

SPEED LIMITS IN THE ROYAL PARKS.—Roads in the Royal Parks will not be affected by the Road Traffic Act, and the special limit of 20 M.P.H. is still to be enforced.

DECREASE IN MOTOR DUTY RECEIPTS.—From the half-yearly Customs and Excise accounts it appears that receipts from motor vehicle duties for the six months ended September 30 decreased by £372,702.

BY-PASS FOR OXFORD.—Terms have been arranged by Oxford Corporation and the County Council with the Ministry of Transport for the construction of a by-pass north of the city at an estimated cost of £360,000.

HAULAGE COMPARISONS.—Blyth Corporation has had a statement as to the cost of scavenging since the acquisition of motor vehicles for the purpose. For six months when only horse vehicles were engaged the cost was £4,432, but for a later six months when there were employed four motors and nine horses the cost decreased to £3,968, the saving being £464, equivalent nearly to a 2d. rate. This, too, is in spite of the increase in the number of houses and the more frequent and efficient scavenging.

AN EXPERT'S PRAISE OF BIRMINGHAM TRAFFIC SIGNALS.—Presiding at a meeting of Birmingham Safety First Council, Mr. O. C. Power, traffic manager of the Birmingham and Midland Omnibus Co., said he had had experience of automatic signals in many other towns, and he thought the system in Birmingham was the best. The lights were better regulated, and being larger than those elsewhere they could be seen much better. It was decided to suggest that an attempt should be made to standardise the period of time during which the amber light is shown.

TAXATION OF ROAD VEHICLES.—A return (Stationery Office, 2s. 6d.) has been issued by the Ministry of Transport giving particulars of the gross receipts from the taxation of road vehicles for the period from December 1, 1929, to August 31, 1930. The gross amount received for licences issued during the nine months was £25,221,380, compared with £23,952,317 in the corresponding period of the previous year. The number of motor vehicles, excluding tramcars and trade licences, was approximately 2,218,000 compared with 2,131,000. The number of mechanically propelled road vehicles registered for the first time in August, 1930, was 15,070, compared with 19,073 in August, 1929.

IRISH ROAD TRAFFIC BILLS.—It is expected that the Road Traffic Bill for the regulation of transport between the provincial parts of the Irish Free State will be considered by the Dail early in the approaching session. Another Bill for the control of traffic in Dublin and the competition arising therefrom will also be laid before the Dail. The Ministry has already received a report from the Commission which sat at the time of the Dublin tramway strike. The General Council of the County Councils has passed a resolution requesting the Government without delay to pass a measure of control which would embody strict driving tests for drivers, the introduction of third-party insurance, effective penalties for dangerous driving, and control over wasteful omnibus competition.

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LONDON, NOVEMBER 15, 1930.

## LONDON CAR WITH CENTRAL DOORWAY.

In the search for improved rolling stock the management of the tramways of the London Underground group never admit finality. The enterprise shown by Mr. C. J. Spencer is, in its way, worthy of being placed on a level with what may be regarded as the classic example of Mr. J. K. Bruce in persuading the London County Council to modernise, as regards comfort and speed, the whole of their rolling stock. During the past few years the London United and the Metropolitan Companies have introduced four new cars which show great advantages in the matters of light weight, speed, comfort and dispatch for loading and unloading. The object, of course, is to secure by practical experience the best possible type of car, in order that it may be available for standardising production at the rapidly approaching period when new cars will be necessary. To a great extent that time has arrived, for orders have been given for 54 cars towards the re-equipment of the Metropolitan Company's system, a new lease of this undertaking having recently been granted by the Middlesex County Council. But the search for the best possible car body has not yet been completed. Mr. Spencer has now introduced a double-deck car with central entrance and exit, its predecessors having been constructed with a rear entrance and front exit. The centre doorway for a double-deck car is novel in this country, though there are some single-deck cars that follow a common American example of a centre opening, but American cars have of late years had, in addition, either a front or a rear exit. The trial of the new car here will be watched with interest in order to ascertain whether the central doorway gives any advantage over the rear entrance and front exit body. The latter design has been found of definite value at busy places on the companies' undertakings. This corroborates the experience of Newcastle in the operation of many similar cars. The merging of two end platforms into one in the Metropolitan car has increased the number of seats by six, giving a total seating capacity of 70, and liberal provision should be available for standing passengers. The closed doors should effectually limit platform accidents, caused by passengers attempting to board or leave a car in motion. Another experiment that is being made with this car is the employment of two conductors, one on each deck, at the rush period. Internally the car has the passenger-attracting features of the other experimental models, notably the sumptuous seating, ample leg and gangway room, and the most effective lighting at night. Externally it has the pleasing lines of its predecessors. The motorman is accommodated in a cab that projects from the platform, and is safeguarded from interference by passengers. The whole industry will wish success to the London companies in the experiment which they have been privileged to initiate.

## THE ROAD TRAFFIC ACT.

DATES FOR THE NEW REGULATIONS.

Definite dates have now been fixed for bringing into operation the various sections of the Road Traffic Act. Mr. Morrison, Minister of Transport, stated on Thursday that most of the provisions of Part I, including those for licensing drivers and those for careless and dangerous driving, will come into operation on December 1, but the abolition of the speed limit for light cars and the new limits for heavier vehicles will not become operative until January 1.

The Minister of Transport is making a grant to cover the cost of 1,000 vehicles, about one-third being motor-cars, and two-thirds motor-cycles, for the mobile police, who will not only be engaged in catching and prosecuting motorists, but should be able to give help and advice where needed. Section 17 of the Act, which deals with the number of persons to be employed in connection with vehicles and trailers, will also come into operation on January 1, but Section 19, dealing with the maximum hours which may be worked by the drivers of heavy vehicles, is to be deferred until February 1.

On and after December 1, the old form of driver's licence will cease to be issued, but the old licences issued up to November 29 will be valid until their normal date of expiry. To obtain a driving licence under the new Act, a new form, to be known as D.L.I., will have to be filled up, which will contain the declaration of physical fitness. In order that there should be uniformity, Mr. Morrison has instructed all licensing authorities to cease sending reminders, as the responsibility for renewal rests on the drivers. All new licences must be signed by the holders.

Part II of the Act, which relates to compulsory insurance against third-party risks, will become operative on January 1, and the draft regulations have been completed. It is proposed to bring Part III, which amends the highway law, into operation on January 1. Parts IV and V, relating to public service vehicles, will become operative in three stages, the final stage being fixed for April 1, 1931.

## OMNIBUS RESULTS IN MANCHESTER.

In an address to Manchester Rotarians, Mr. R. Stuart Pilcher, general manager of Manchester Corporation Transport Department, said that since the conversion of No. 53 route from tramcars to omnibuses six and a half months ago receipts had gone up by £9,200 and 1,400,000 more passengers had been carried. The result was extraordinary, and they had had to order more omnibuses for this route. He thought a similar result would be shown in the recently converted Bradford-road route. Speaking of the Altrincham route, which has just been converted, Mr. Pilcher said it was singular that tramcar traffic could not be maintained on this main road out of Manchester. People would pay 50 per cent. more to ride in an omnibus than in one of the best and latest high-speed tramcars.

Comparing working costs, Mr. Pilcher said that in Manchester this was 17d. for an 80-seat tramcar, as against 13d. for an omnibus. While at busy times the car carried a great many more passengers, at slack times it was carrying a great deal of unnecessary weight. In the last six and a half months the omnibus receipts had increased £31,000, and these vehicles had carried two and a half million more passengers.

Mr. Pilcher added that Manchester Corporation had bought a Diesel-engine omnibus which would be running on the streets shortly. This engine could operate at a cost of 2d. a mile less per vehicle. As in Manchester their omnibuses were running at a profit of a fraction of a penny, a reduction of 2d. a mile might lead to cheaper fares. By adopting the Diesel engine it would also be possible to use fuel which could be made in great quantities by gas-works, and such a discovery would be of great national importance in using up surpluses of coal.

**Burnley Omnibus Drivers' Wages.**—In reply to an application from omnibus drivers in the employ of the Burnley Transport Department, the general manager recommended the same rate as is paid to tramcar drivers on the Manchester-road and Harle Syke routes. This was adopted by the Transport Committee, the scale being: 1st year, 1s. 3½d. per hour; 2nd year, 1s. 3¾d. per hour; 3rd year, 1s. 3¾d. per hour; 4th year, 1s. 4d. per hour (maximum).

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## RAILWAY WAGES.

COMPANIES' PROPOSALS.

The general managers of the four group railways met the full executive committees of the National Union of Railwaymen, the Associated Society of Locomotive Engineers and Firemen, and the Railway Clerks' Association, on Thursday. An official statement records that Sir Ralph Wedgwood, the chairman of the General Managers' Conference, made a full statement explaining the present financial position of the companies, and submitted a programme of modifications of rates and conditions of service of all the staff whose rates and conditions are subject to the jurisdiction of the National Wages Board. The Trade Union representatives undertook to give a reply at the earliest possible moment. The proceedings lasted three hours.

The main points of the companies' proposals are as follow:—Adult male staff: reductions in current and standard rates of 6s. per week subject to a minimum weekly rate of 38s. Junior male staff: a reduction of 3s. per week. Female staff: a reduction of 3s. per week.

Conditions of service: The standard weekly hours, which may include Sunday duty, to be worked as the company may require, where practicable the hours to be rostered, in six turns usually; but where the exigencies of the service require either less or more than six turns, spreadover turns of duty to be worked as and when required.

Payment to be made only for time actually worked. Overtime at rate and a quarter to be paid for time worked in excess of the standard weekly hours. Sunday and night duty to be paid for at ordinary rate, but overtime at the rate of time and a quarter. Reductions are proposed also in the rates of pay of the salaried staff.

The following table is from the Ministry of Transport return dated March 8, the last available, and shows the wage scale and the average weekly payments. Overtime and Sunday and night duty, of course, account for the additional income:—

| | Salary or Wage. | | Average Weekly Payments. | |
|---|---|---|---|---|
| | s. | d. | s. | d. |
| Carriage cleaners ... ... ... | 46 | 1 | 54 | 0 |
| Carters ... ... ... ... | 50 | 8 | 56 | 2 |
| Checkers ... ... ... ... | 54 | 7 | 58 | 7 |
| Engine cleaners ... ... ... | 47 | 8 | 51 | 6 |
| Engine drivers and motormen ... | 88 | 0 | 101 | 0 |
| Firemen and assistant motormen | 68 | 4 | 77 | 9 |
| Guards ... ... ... ... | 64 | 11 | 73 | 0 |
| Permanent-way gangers ... ... | 53 | 3 | 59 | 3 |
| ,, undermen ... | 47 | 4 | 54 | 7 |
| Signalmen ... ... ... ... | 59 | 3 | 66 | 11 |
| Ticket collectors, Class 1 ... ... | 58 | 1 | 64 | 6 |
| ,, ,, ,, 2 ... ... | 54 | 0 | 58 | 6 |

## HULL TRAMWAYS MANAGER.

WRITS AGAINST TWO ALDERMEN: A MOTION WITHDRAWN.

Writs for alleged slander have been issued by Mr. E. S. Rayner, manager of the Hull Corporation Transport, against Alderman A. Stark (Labour) and Alderman R. Wheeldon (Conservative). Both spoke at the discussion at the recent meeting of the City Council when it was decided to ask Mr. Rayner to resign his position. Mr. Rayner has refused to resign. Councillor J. G. Hewett had given notice of a motion asking the Council to rescind their decision, but following a discussion at a meeting of the Council on Monday he withdrew his motion.

At Monday's meeting the Town Clerk said he had been asked to report on the carbon copy of a letter found near the Council Chamber immediately after the last meeting. This was addressed to the editor of a London newspaper, was unsigned, and referred to tramway affairs. On the day following the meeting the manager called at his office and informed him that he had written the letter, which had not appeared in the Press.

The Town Clerk read a letter from Mr. Rayner, in which he stated that the draft letter, which was never sent, was intended as a reply to a long report which had appeared in a daily newspaper. That report gave information which could only have been obtained by someone in possession of the verbatim notes of the inquiry, which were marked "Private and confidential." That report was intended to prejudice the members of the Council and the public before the matter had been considered, and he was determined that no such prejudice should go unchallenged.

Councillor R. Richardson (Deputy Lord Mayor) moved the adjournment of consideration both of the Town Clerk's report and of Councillor Hewett's motion. The Lord Mayor ruled, however, that the two matters must be dealt with separately. The motion to defer the Town Clerk's report was lost by three votes, and the discussion proceeded.

Alderman Pearlman said he came to the meeting with the intention of giving the manager another chance, but that had gone. He was sick and tired of the "lobbying" of members by one or two officials.

A resolution accepting the Town Clerk's report was carried. Councillor Hewett then stated that in view of what had happened his position was altered and he asked leave to withdraw his motion on the ground that, owing to the injudicious action of the manager, "no unbiassed action is possible to-day." Permission to withdraw the motion was unanimously given.

## MEMORIAL TO GEORGE WESTINGHOUSE.

The November issue of the "International Merchant," the house journal of the Westinghouse Electric International Co., of East Pittsburgh, Pa., U.S.A., gives a report of the unveiling in Pittsburgh's most picturesque park of a memorial to George Westinghouse. Subscribers to the memorial comprised more than 50,000 employees to whom this great international business gives employment. Among notable visitors present at the unveiling were Lord Southborough, a friend and business associate of George Westinghouse, and Mr. H. G. Brown, deputy chairman of the Westinghouse Air Brake and Saxby Signal Co., Ltd., of London.

Lord Southborough was a speaker at the banquet subsequently given to the visitors. George Westinghouse's creative ability was inspired by a train wreck which he had witnessed. He conceived the idea of the air brake, and after a great struggle secured its adoption in the U.S.A. and Europe. His further inventions included pneumatic signals and switches, the first electric street trolley cars, the first electric locomotive, an automatic telephone exchange, a jet steam turbine, a piping system for natural gas, and a rotary engine. In the face of bitter opposition he championed the use of alternating current. He erected the world's first hydro-electric plant at Niagara Falls, and built the world's largest generators in order to light with electricity the Chicago World's Fair of 1892.

## MISCELLANEOUS NEWS AND NOTES.

**Sheffield Tramways Committee** is obtaining tenders for the supply of ten double-deck and eight single-deck motor omnibuses.

**A Stockport Scheme.**—Stockport Council proposes to substitute motor omnibuses for the tramways between Cheadle Green and Gatley.

**Belfast Tramways Committee** has authorised the general manager to convert an omnibus for the purpose of using heavy oil fuel as an experiment.

**Northampton Corporation** is to erect new office accommodation and to convert one of the tramway car sheds to accommodate omnibuses, at a total approximate cost of £8,000.

**New Zealand Tramway Extension.**—The Transport Board of Auckland, New Zealand, has decided to extend the tramways from Mont Albert to Avondale. Ten new cars will be required, of which five will be constructed in the board's workshops.

**More Omnibuses for Southend.**—At a meeting of Southend Town Council on Monday it was decided to run a service of motor omnibuses in conjunction with the tramway services. During the last year there has been a loss of between £3,000 and £4,000 on the tramways.

**Safety Zones for Tramway Passengers.**—It is proposed to institute safety zones on the carriage-ways at the principal tramway stopping places in Dublin. Intending passengers will be able to stand in the roadway within the area of the zones, which will be prohibited to other traffic.

**Reopening of the Kingsway Subway.**—It is hoped that the enlarged subway between the Victoria-embankment and Southampton-row will be opened for traffic on December 17. Through traffic will then be instituted by double-deck cars between North and South London.

**New Traffic Commissioners.**—So far some 3,200 applications have been received for the posts of the twelve traffic commissioners to be appointed by the Minister of Transport. The Minister has been much occupied during the past week in interviews in connection with the appointments, and it is hoped that decisions will be announced by the end of the month.

**Petrol Supply of Long-Distance Omnibuses.**—Manchester Corporation Transport Department has placed in service a tank of 250 gallons capacity, mounted on 30-cwt. chassis, for replenishing the fuel supply of long-distance omnibuses. Owing to the mileage worked per day it is not practicable for these omnibuses to carry sufficient petrol for the day's requirements.

**New Life-Saving Attachment.**—Dr. Vernon Clifford, of 63, Grosvenor-street, London, has invented a motor vehicle attachment for saving life. It consists of a grooved roller fixed 10 inches above the ground. Automatic action drops this to two inches from the ground and sets it revolving in the opposite direction to that of the wheels of the vehicle, so that anyone falling in front of it is rolled along the ground.

**Trolleybus Proposal for Plymouth.**—The general manager of Plymouth Corporation Tramways has been asked to submit a report on the practicability of adopting trolleybuses on the Prince Rock and Beaumont-road sections of the tramways. A special committee has visited the installations at Wolverhampton, Nottingham and Hastings, and has reported that they are favourably impressed by the system.

**The Bradford Managership.**—For the position of general manager of Bradford Corporation Tramways, rendered vacant by the retirement of Mr. R. H. Wilkinson through ill-health, over fifty applications have been received. The applications will be considered by the Tramways Committee as appointed at the annual meeting of the City Council on November 10. Mr. C. J. Spencer is continuing his consultations with the Committee.

**New Omnibus Station at Chelmsford.**—The Eastern National Omnibus Co. is making extensive alterations to their depot at Chelmsford. When completed it will be one of the finest stations in the Eastern Counties, from which all long-distance omnibuses will start. New offices and waiting rooms are to be constructed, and departure platforms provided. The L.N.E.R. and the L.M.S.R. are jointly interested in this company.

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**Trolleybuses in Derby.**—Derby Transport Committee has arranged to discontinue the tramway service on the Nottingham-road route after November 9. Petrol omnibuses will take the place of the tramcars temporarily, but later the trolleybuses will come into operation. The Committee not long ago decided gradually to substitute trolleybuses for tramways. Should the operation of the new vehicles on the Nottingham-road prove satisfactory, it is anticipated that arrangements will be made without delay to install them on other routes.

**Tramcars as Fast as Omnibuses.**—In an address to the Manchester Y.M.C.A., Mr. R. Stuart Pilcher, general manager of Manchester Corporation Transport, said that in a test of tramcar and omnibus over a distance of 14 miles, with ten stops of ten seconds each, the omnibus was only half a mile an hour faster than the tramcar. Similar tests carried out elsewhere had shown that there is no appreciable difference between the speeds of omnibuses, tramcars and trolleybuses. People made the mistake of comparing the express omnibus, making few stops, with the car stopping at every station.

**Resignation of the Nelson Manager.**—At a meeting of Nelson Town Council on Monday, a statement was made by the Mayor (Alderman R. Winterbottom) regarding the resolution of the Electricity and Light Railways Committee that the electrical engineer and tramways manager, Mr. G. F. Nayler, should resign his appointment forthwith. The Committee's decision was reported in our last issue. The Council went into committee and were addressed by Major J. Symonds, legal adviser to the National Association of Local Government Board Officers, on behalf of Mr. Nayler. In open meeting the Town Council confirmed the decision of the Committee, and the town clerk then intimated that a letter had been received from Mr. Nayler, dated November 9, resigning his position. The Mayor said that in September, 1928, the Council included the electrical engineer among the officials who were granted £100 per annum for the use and maintenance of their private cars; they had to provide their own petrol, oil, repairs, and cleaning. About the end of September, certain information was received, and the borough treasurer was instructed to investigate. His report showed that petrol to the value of £118 had been supplied from October 3, 1928, to October 11, 1930. Accounts had been rendered to Mr. Nayler, who on October 8 and 10, paid accounts for petrol amounting to £76, leaving £42 outstanding. A sub-committee was appointed to consider reorganisation of the three departments under the electrical engineer's control.

## CONTRACTS.

**Wednesbury Town Council** has placed an order with the Forest City Electrical Co. for traffic control signals at £311.

**Lincoln Town Council** has placed an order with the Forest City Electrical Co. for automatic traffic signals at £1,129.

**East Surrey Traction Co.** has placed a fourth repeat order for power petrolling plant with the Equipment and Engineering Co., Ltd.

**Belfast Tramways Committee** has placed an order with the Equipment and Engineering Co., Ltd., for a No. 4 rail-grinder.

**Nottingham Corporation** were stated in our issue of November 8 to have placed an order for another trolleybus with Ransomes, Sims & Jefferies, Ltd. We are informed that the announcement is incorrect.

**The Equipment and Engineering Co., Ltd.,** have recently supplied Luchard high pressure air compressors to Norwich City Tramways, General Motor and Tyre Co., of Harwich, Ribble Motor Services, and Newport Corporation.

**Rotherham Transport Committee** has authorised the purchase of electric windscreen wipers at a cost of £1 each for vehicles not already equipped, and the purchase of 15 pairs of head lamps for trolleybuses at an approximate cost of £70.

**Dennis Brothers, Ltd.,** are supplying 108 motor vehicles of the 152 recently ordered by the Great Western Railway Co. The Dennis model is their 2-tonner, which is largely used by the Southern Railway, but the G.W.R. order is for the forward control pattern, which gives additional body space.

**G.E.C. Tramways Equipment for Auckland.**—Twelve car sets of electrical equipment for the tramways of the Auckland Transport Board have been ordered from the General Electric Company, Ltd., Magnet House, Kingsway, W.C.2. Each set consists of four motors, type W.T. 28 A.L., each developing 40 b.h.p. at 500 volts on the one-hour rating, one set of resistances, lightning arrester and choke coil. This is the third repeat order from the Auckland Transport Board received by the General Electric Company.

**London County Council** on Tuesday considered tenders for the supply of twelve water tube boilers for the tramways power station. The specification covered twelve 50,000 lb. boilers, giving a total capacity of 600,000 lbs. of steam an hour. The estimate of the general manager of the Tramways Department for the twelve boilers was £200,000. All the firms who submitted tenders stated, however, that with the size of grate specified they could guarantee a continual load of 60,000 lbs. a boiler, so that only ten boilers would give the required output of 600,000 lbs. an hour. Yarrow & Co., Ltd., offered to supply ten instead of twelve units at a proportionate reduction in price. The Highways Committee recommended the acceptance, with certain modifications, of so much of the tender of Yarrow & Co., Ltd., as related to the supply of ten boilers, including the distribution switchgear, grit collecting plant made by Pneumatic Conveyances and Extraction (1929), Ltd., and mounted with accessories manufactured by Dewrance & Co., at the reduced figure of £210,225. All the plant to be supplied under the contract will be of British manufacture. The recommendation was adopted.

## PERSONAL.

**Alderman R. Mell,** chairman of the Tramways Committee, has been elected Lord Mayor of Hull.

**Mr. James Dalrymple,** former general manager of the Glasgow Corporation Tramways, left this week for a voyage round the world. He is accompanied by Mrs. Dalrymple.

**Mr. J. Porter,** permanent way foreman in the Manchester Corporation Tramways Department, has retired after fifty years' service. The workmen have presented him with a diamond ring.

**Councillor A. Aplin,** the new Mayor of Deptford, was formerly a tramcar conductor, and has been a member of the Council for twelve years. He is the local secretary of the passenger section of the Transport and General Workers' Union.

**Alderman W. Greenwood, J.P.,** is the nominee of Salford Corporation for the panel from which the Minister of Transport will select two of the traffic commissioners for the North-Western Area under the Road Traffic Act. The Alderman is the chairman of Salford Tramways Committee and of the Lancashire and Cheshire Tramway Authorities' Council.

**Councillor Dollan Wins Appeal.**—Councillor P. J. Dollan, convener of Glasgow Transport Committee, has won his appeal in connection with the slander action which was a sequel to alleged graft in the granting of contracts for omnibuses. It was alleged that Mr. Andrew Rennie, Jun., a company promoter, had stated on three separate occasions that £10,000 was to be divided among certain members of the Corporation so that a motor company would receive an important contract for the supply of omnibuses. In June last, Sheriff Substitute Robertson found that the three occasions were privileged, and held Councillor Dollan liable in expenses. Sheriff Principal Mackenzie has now given judgment in which he stated that it was not a matter of dispute that the statements were false and injurious to the character of the pursuer; the defence was that they were made without malice and on privileged occasions. He found that on one of the occasions Mr. Rennie's statements were not privileged, and awarded Councillor Dollan £75 damages with expenses.

**Brighton Tramways Manager Censured.**—At the meeting of the Brighton Town Council on Monday there was a debate on the action of the tramways engineer and manager, Mr. W. Marsh, in relaying a portion of the Dyke-road track without consulting the surveyor, and in using granite setts as paving. A resolution had been passed by the Council in 1925 forbidding Mr. Marsh to relay any of the track without first consulting the surveyor, and directing that granite setts should not be used for paving in the future. The Tramways Committee had stated that it regretted not informing the surveyor of the work, and that the decision to start it was due to a misapprehension of the effect of the resolution of 1925. The General Purposes Committee, which consists of the whole Council, had investigated the matter, and after hearing Mr. Marsh's explanation, passed a resolution that he be censured and warned that any further defiance of the decision of the Council would result in his dismissal, and that his salary be reduced by £100 per annum. Alderman Sir C. Thomas-Stanford moved the deletion of the reduction of salary. Alderman J. L. Thompson, seconding, said Mr. Marsh was one of the best servants Brighton had ever had, and several other members spoke in high terms of Mr. Marsh's services. Councillor C. G. Yates, chairman of the Tramways Committee, said the Committee ordered the work to be done, and they must take the blame. The amendment to delete the reduction of salary was carried by 35 votes to 26, and with this alteration the vote of censure was adopted.

## FINANCIAL ITEMS.

**Calcutta Tramways.**—The directors have decided to postpone payment of dividend on the ordinary shares until the result of the year's working to December 31 next is known. Last year an interim dividend of 4½d. per share, free of tax, was paid.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended November 12 amounted to £83,131, a decrease of £2,184 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to November 12 (32 2-7 weeks) the total receipts were £2,674,428, a decrease of £29,154.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended October 25 gave total receipts of £421,219, or £5,375 more than in the corresponding week of last year. The aggregate receipts for thirty weeks amounted to £12,695,658, an increase of £127,043 over the corresponding period of last year.

**Melbourne Tramways.**—For the year ended June 30, the total revenue was £2,349,154, compared with £2,435,548 in the previous year. Working expenses were £1,658,830 compared with £1,704,678, leaving a surplus on operation of £690,324. Deducting interest and other charges, £352,087 was available for appropriation, as follows: Loan redemption account, £69,224; loan sinking fund, £5,199; renewals reserve account, £159,100; general reserve, £170,000; leaving a deficit of £51,436. Payments to State consolidated revenue were £118,503, making the deficit £169,939, met by transfer from general reserve account. £4,798 was also provided out of revenue account for the public risk reserve account, which now stands at £50,000. The capital cost of the undertaking at June 30 was: Cable tramways, £1,487,012; electric tramways, £6,672,029; motor omnibuses, £120,605; total, £8,279,646.

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**Birmingham Traffic Receipts.**—In the traffic return of the Birmingham Corporation Tramway and Omnibus Department for the week ended November 4, published in this week's issue, there is a considerable difference in the aggregate decrease for tramcars, the aggregate increase for motor omnibuses, and the aggregate decrease for trolleybuses as compared with the previous week's return. This has been brought about as a result of alterations made in October last year when the statistical week ended was changed from Saturday to Tuesday. Until the issue of the present return the aggregate receipts shown in the returns for 1930 were two days more than the aggregate for 1929, but this has now been automatically adjusted, and for the future comparisons will be normal.

**Manchester Corporation** has accepted the offer of Crossley Motors, Ltd., for the supply of a double-deck omnibus chassis with a Gardener six-cylinder Diesel oil engine. This engine is to be fitted to one of the Crossley double-deck bodies which the company is supplying to the Corporation under an existing contract.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | Nov. 11 | 585 | 743 | + 158 | 32 | 18,965 | — 18 |
| „ Motor Buses ... | „ 11 | 273 | 365 | + 92 | 32 | 9,688 | + 1,821 |
| „ Total ... ... | „ 11 | 858 | 1,108 | + 250 | 32 | 28,653 | + 1,803 |
| Aberdeen Corp. ... | „ 5 | 4,674 | 4,791 | + 117 | 22¾ | 122,496 | + 2,375 |
| Ashton-u-Lyne Corp. | „ 1 | 893 | 843 | — 50 | 31 | 26,376 | — 2,182 |
| „ Motor Buses ... | „ 1 | 458 | 486 | + 28 | 31 | 15,399 | + 178 |
| „ Trolley Buses ... | „ 1 | 286 | 262 | — 24 | 31 | 8,057 | — 635 |
| „ Total ... ... | „ 1 | 1,637 | 1,591 | — 46 | 31 | 49,832 | — 2,639 |
| Ayr Corporation ... | „ 8 | 442 | 399 | — 43 | 25 | 16,161 | — 1,291 |
| Barrow Corporation... | „ 8 | 521 | 518 | — 3 | 32 | 18,603 | — 1,113 |
| „ Motor Buses ... | „ 8 | 371 | 371 | Nil | 32 | 13,329 | + 643 |
| „ Total ... ... | „ 8 | 892 | 889 | — 3 | 32 | 31,932 | — 470 |
| Belfast City ... ... | „ 7 | 11,070 | 11,332 | + 262 | 31½ | 364,173 | + 11,135 |
| „ Motor Buses ... | „ 7 | 1,156 | 1,363 | + 207 | 31½ | 41,454 | + 8,319 |
| „ Total ... ... | „ 7 | 12,226 | 12,695 | + 469 | 31½ | 405,627 | + 19,454 |
| Birkenhead Corp. ... | „ 9 | 1,549 | 1,388 | — 161 | 32 | 48,699 | — 5,674 |
| „ Motor Buses ... | „ 9 | 3,081 | 3,797 | + 716 | 32 | 121,261 | + 2,599 |
| „ Total ... ... | „ 9 | 4,630 | 5,185 | + 555 | 32 | 169,960 | — 3,075 |
| Birmingham Corp. ... | „ 4 | 27,516 | 26,137 | — 1,379 | 31 | 811,597 | — 42,807 |
| „ Motor Buses ... | „ 4 | 13,679 | 16,723 | + 3,044 | 31 | 484,189 | + 72,987 |
| „ Trolley Buses ... | „ 4 | 562 | 530 | — 32 | 31 | 16,717 | — 656 |
| „ Total ... ... | „ 4 | 41,757 | 43,390 | + 1,633 | 31 | 1,312,503 | + 29,524 |
| Blackburn Corp. ... | „ 5 | 1,790 | 1,694 | — 96 | 31¾ | 57,020 | — 5,215 |
| „ Motor Buses ... | „ 5 | Nil | 325 | + 325 | 31¼ | 10,092 | + 10,092 |
| „ Total ... ... | „ 5 | 1,791 | 2,019 | + 229 | 31¾ | 67,112 | + 4,877 |
| Bradford Corporation | „ 8 | 10,060 | 9,068 | — 992 | ... | ... | ... |
| „ Motor Buses ... | „ 8 | 3,298 | 3,073 | — 225 | ... | ... | ... |
| „ Trolley Buses ... | „ 8 | 1,059 | 1,944 | + 885 | ... | ... | ... |
| „ Miscellaneous ... | „ 8 | 393 | 268 | — 125 | ... | ... | ... |
| „ Total ... ... | „ 8 | 14,810 | 14,353 | — 457 | 32 | 457,750 | — 18,188 |
| Brighton Corporation | „ 9 | 2,208 | 2,179 | — 29 | 31½ | 90,398 | + 1,672 |
| Burnley Corporation... | „ 8 | 2,959 | 2,876 | — 83 | ... | ... | ... |
| „ Motor Buses ... | „ 8 | 638 | 708 | + 70 | ... | ... | ... |
| „ Total ... ... | „ 8 | 3,597 | 3,584 | — 13 | ... | ... | ... |
| Burton-on-Trent Corp. | Oct. 19 | 824 | 891 | + 67 | 29 | 23,948 | + 943 |
| Bury Corporation ... | Nov. 9 | 1,967 | 1,571 | — 396 | 31½ | 56,279 | — 8,518 |
| „ Motor Buses ... | „ 9 | 772 | 1,392 | + 620 | 31½ | 38,358 | + 21,990 |
| „ Total ... ... | „ 9 | 2,739 | 2,963 | + 224 | 31½ | 94,637 | + 13,472 |
| Cardiff Corporation ... | „ 8 | 7,625 | 7,487 | — 138 | 31½ | 248,471 | + 2,042 |
| Chester Corporation ... | „ 9 | 409 | Nil | — 409 | 32 | Nil | — 14,108 |
| „ Motor Buses ... | „ 9 | Nil | 660 | + 660 | 32 | 21,440 | + 21,440 |
| „ Total ... ... | „ 9 | 409 | 660 | + 251 | 32 | 21,440 | + 7,332 |
| Chesterfield Corp. ... | „ 10 | 1,963 | 1,889 | — 74 | 32 | 62,143 | + 1,002 |
| Colchester Corp. ... | „ 12 | 545 | 533 | — 12 | 33 | 20,132 | + 1,938 |
| Colne Corporation ... | „ 12 | 701 | 689 | — 12 | 32 | 22,757 | — 399 |
| Coventry Corporation | „ 9 | 2,148 | 1,892 | — 256 | 32 | 62,138 | — 6,027 |
| „ Motor Buses ... | „ 9 | 1,736 | 1,801 | + 65 | 32 | 57,251 | + 6,030 |
| „ Total ... ... | „ 9 | 3,884 | 3,693 | — 191 | 32 | 119,389 | + 3 |
| Darlington Corp ... | „ 8 | 1,010 | 1,053 | + 43 | 31½ | 33,765 | + 2,509 |
| Derby Corporation ... | „ 8 | 2,467 | 2,327 | — 140 | 32 | 77,991 | — 2,660 |
| „ Motor Buses ... | „ 8 | 796 | 919 | + 123 | 32 | 29,399 | + 5,832 |
| „ Total ... ... | „ 8 | 3,263 | 3,246 | — 17 | 32 | 107,390 | + 3,172 |
| Dover Corporation ... | „ 8 | 360 | 350 | — 10 | 32 | 14,153 | + 456 |
| Dundee Corporation... | Oct. 28 | 2,609 | 2,532 | — 77 | 23½ | 60,854 | — 2,051 |
| „ Motor Buses ... | „ 28 | 838 | 1,173 | + 335 | 23½ | 27,117 | + 7,031 |
| „ Total ... ... | „ 28 | 3,447 | 3,705 | + 258 | 23½ | 87,971 | + 4,980 |
| East Ham Corp. ... | Nov. 8 | 2,327 | 2,200 | — 127 | 31½ | 72,645 | — 30 |
| Edinburgh Corp. ... | „ 1 | 14,321 | 14,389 | + 68 | 24¼ | 365,240 | + 6,142 |
| „ Motor Buses ... | „ 1 | 3,400 | 3,643 | + 243 | 24¼ | 92,679 | + 7,145 |
| „ Total ... ... | „ 1 | 17,721 | 18,032 | + 311 | 24¼ | 457,919 | + 13,287 |
| Exeter Corporation ... | „ 12 | 792 | 698 | — 94 | 33 | 26,332 | — 2,443 |
| „ Motor Buses ... | „ 12 | 196 | 396 | + 200 | 33 | 11,203 | + 6,150 |
| „ Total ... ... | „ 12 | 988 | 1,094 | + 106 | 33 | 37,535 | + 3,707 |
| Glasgow Corporation... | Oct. 25 | 45,780 | 44,410 | — 1,370 | 21 | 911,346 | — 6,930 |
| „ Motor Buses ... | „ 25 | 6,700 | 10,438 | + 3,738 | 21 | 183,909 | + 68,608 |
| „ Total ... ... | „ 25 | 52,480 | 54,848 | + 2,368 | 21 | 1,095,255 | + 61,708 |
| Gloucester Corp. ... | Nov. 5 | 602 | 707 | + 105 | 31½ | 22,642 | + 4,339 |
| Grimsby Corporation | „ 8 | 1,464 | 1,568 | + 104 | 32 | 51,409 | + 5,201 |
| Halifax Corporation | „ 5 | 4,563 | 5,210 | + 647 | 31½ | 161,838 | + 17,512 |
| Huddersfield Corp. ... | „ 8 | 6,357 | 6,320 | — 36 | 32 | 204,707 | — 1,899 |
| Hull Corporation ... | „ 8 | 6,238 | 5,870 | — 368 | 32 | 183,898 | — 8,194 |
| „ Motor Buses ... | „ 8 | 1,487 | 1,810 | + 323 | 32 | 52,058 | + 8,117 |
| „ Total ... ... | „ 8 | 7,725 | 7,680 | — 45 | 32 | 235,956 | — 77 |
| Ilford Corporation ... | „ 8 | 1,501 | 1,503 | + 2 | 31½ | 48,261 | + 625 |
| Ipswich Corp. Trol.Bus | „ 8 | 1,312 | 1,317 | + 5 | 31½ | 43,553 | + 2,284 |
| Isle of Thanet ... | „ 5 | 404 | 374 | — 30 | 44¼ | 38,195 | — 4,556 |
| Kilmarnock Corp. ... | „ 8 | 488 | 496 | + 8 | 25½ | 12,607 | + 545 |
| Lancashire Un. ... | „ 2 | 2,292 | 2,233 | — 59 | 43½ | 93,416 | — 5,418 |
| „ Motor Buses ... | „ 2 | 4,364 | 4,748 | + 384 | 43½ | 218,261 | + 26,732 |
| Leeds Corporation ... | „ 8 | 19,549 | 19,843 | + 294 | 31½ | 635,597 | + 10,390 |
| Leicester Corp. ... | „ 8 | 8,580 | 8,373 | — 207 | 32 | 267,637 | — 211 |
| Lincoln Corp. ... | „ 9 | 871 | 853 | — 18 | 32 | 30,170 | + 202 |
| Liverpool Corp. ... | „ 8 | 27,189 | 26,513 | — 676 | 31½ | 853,292 | — 15,381 |
| „ Motor Buses ... | „ 8 | 3,003 | 3,342 | + 339 | 31½ | 105,165 | + 15,025 |
| „ Total ... ... | „ 8 | 30,192 | 29,855 | — 337 | 31½ | 958,457 | — 356 |
| London County Coun.. | „ 12 | 85,315 | 83,131 | — 2,184 | 32¼ | 2,674,428 | — 29,154 |
| Luton Corporation ... | „ 5 | 384 | 382 | — 2 | 31¼ | 13,383 | + 278 |
| Maidstone Corp. ... | „ 6 | 143 | Nil | — 143 | 31¼ | Nil | — 6,718 |
| „ Motor Buses ... | „ 6 | 325 | 249 | — 76 | 31¼ | 8,828 | — 1,016 |
| „ Trolley Buses ... | „ 6 | 285 | 537 | + 252 | 31¼ | 19,473 | + 9,685 |
| „ Total ... ... | „ 6 | 753 | 786 | + 33 | 31¼ | 28,301 | + 1,951 |
| Manchester Corp. ... | „ 1 | 35,189 | 32,445 | — 2,744 | 31 | 991,785 | — 90,499 |
| „ Motor Buses ... | „ 1 | 4,841 | 9,191 | + 4,350 | 31 | 269,525 | + 115,629 |
| „ Total ... ... | „ 1 | 40,030 | 41,636 | + 1,606 | 31 | 1,261,310 | + 25,130 |
| Middlesbrough Corp. | „ 11 | 1,178 | 922 | — 256 | 32¼ | 33,066 | — 3,753 |
| „ Motor Buses ... | „ 11 | 549 | 524 | — 25 | 32¼ | 18,276 | + 1,184 |
| „ Total ... ... | „ 11 | 1,727 | 1,446 | — 281 | 32¼ | 51,342 | — 2,569 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty.Corp. | Nov. 8 | 9,541 | 8,330 | — 1,211 | 31½ | 274,234 | — 47,233 |
| „ Motor Buses ... | „ 8 | 1,900 | 3,533 | + 1,633 | 31½ | 103,149 | + 37,891 |
| „ Total ... ... | „ 8 | 11,441 | 11,863 | + 422 | 31½ | 377,383 | — 9,342 |
| Newport Corporation | „ 1 | 1,665 | 1,089 | — 576 | 31 | 44,369 | — 7,279 |
| „ Motor Buses ... | „ 1 | 746 | 1,287 | + 541 | 31 | 30,707 | + 7,229 |
| „ Total ... ... | „ 1 | 2,441 | 2,376 | — 35 | 31 | 75,076 | — 50 |
| Northampton Corp. ... | „ 7 | 1,115 | 749 | — 366 | 31¾ | 31,479 | — 3,840 |
| „ Motor Buses ... | „ 7 | 700 | 1,052 | + 352 | 31¾ | 26,561 | + 5,197 |
| „ Total ... ... | „ 7 | 1,815 | 1,801 | — 14 | 31¾ | 58,040 | + 1,357 |
| Nottingham Corp. ... | „ 6 | 6,426 | 5,644 | — 782 | 31¾ | 182,238 | — 27,288 |
| „ Motor Buses ... | „ 6 | 2,721 | 3,638 | + 917 | 31¾ | 107,464 | + 32,392 |
| „ Trolley Buses ... | „ 6 | 611 | 1,184 | + 573 | 31¾ | 37,949 | + 19,143 |
| „ Total ... ... | „ 6 | 9,758 | 10,466 | + 708 | 31¾ | 327,651 | + 24,247 |
| Oldham Corporation | „ 8 | 3,661 | 3,405 | — 256 | 33 | 110,471 | — 7,205 |
| „ Motor Buses ... | „ 8 | 2,003 | 1,896 | — 107 | 33 | 65,151 | — 1,275 |
| „ Total ... ... | „ 8 | 5,664 | 5,301 | — 363 | 33 | 175,622 | — 8,480 |
| Plymouth Corp. ... | „ 8 | 3,595 | 3,069 | — 526 | 31½ | 116,753 | — 5,671 |
| „ Motor Buses ... | „ 8 | 2,079 | 2,733 | + 654 | 31½ | 80,121 | + 17,358 |
| „ Total ... ... | „ 8 | 5,674 | 5,802 | + 128 | 31½ | 196,874 | + 11,687 |
| Portsmouth Corp. ... | „ 8 | 3,763 | 3,368 | — 395 | 32 | 138,380 | — 13,083 |
| „ Motor Buses ... | „ 8 | 1,804 | 2,821 | + 1,017 | 32 | 108,760 | + 41,787 |
| „ Total ... ... | „ 8 | 5,567 | 6,189 | + 622 | 32 | 247,140 | + 28,704 |
| Preston Corporation... | „ 5 | 1,720 | 1,678 | — 42 | 31¾ | 52,651 | — 2,195 |
| „ Motor Buses ... | „ 5 | 517 | 521 | + 4 | 31¾ | 16,363 | + 754 |
| „ Total ... ... | „ 5 | 2,237 | 2,199 | — 38 | 31¾ | 69,014 | — 1,447 |
| Rawtenstall Corp. ... | „ 9 | 884 | 629 | — 255 | 31½ | 20,665 | — 6,330 |
| „ Motor Buses ... | „ 9 | 517 | 678 | + 161 | 31½ | 22,281 | + 5,575 |
| „ Total ... ... | „ 9 | 1,401 | 1,307 | — 94 | 31½ | 42,946 | — 755 |
| Reading Corporation | „ 6 | 1,522 | 1,442 | — 80 | 32 | 45,812 | — 2,371 |
| „ Motor Buses ... | „ 6 | 897 | 1,045 | + 148 | 32 | 32,246 | + 3,127 |
| „ Total ... ... | „ 6 | 2,419 | 2,487 | + 68 | 32 | 78,058 | + 756 |
| Rochdale Corp. ... | „ 8 | 2,836 | 2,232 | — 604 | ... | 86,442 | — 6,884 |
| „ Motor Buses ... | „ 8 | 1,583 | 2,171 | + 588 | — | 51,616 | + 1,224 |
| „ Total ... ... | „ 8 | 4,419 | 4,403 | — 16 | .. | 138,058 | — 5,660 |
| Rotherham Corp. ... | „ 10 | 2,657 | 2,684 | + 27 | 32 | 89,446 | + 2,310 |
| Salford Corporation ... | „ 9 | 11,284 | 10,972 | — 312 | 31½ | 355,447 | — 2,135 |
| Sheffield Corp. ... | „ 8 | 21,125 | 20,132 | — 993 | 30½ | 649,693 | — 22,654 |
| Southampton Corp. ... | „ 5 | 3,362 | 3,367 | + 5 | 32 | 111,140 | + 2,261 |
| „ Motor Buses ... | „ 5 | 852 | 892 | + 40 | 32 | 27,832 | + 2,824 |
| „ Total ... ... | „ 5 | 4,214 | 4,259 | + 45 | 32 | 138,972 | + 5,085 |
| Southend-on-Sea Corp. | „ 12 | 1,817 | 1,749 | — 68 | 32¼ | 73,609 | — 3,640 |
| „ Trolley Buses ... | „ 12 | 199 | 234 | + 35 | 32¼ | 10,550 | + 3,219 |
| „ Total ... ... | „ 12 | 2,016 | 1,983 | — 33 | 32¼ | 84,159 | — 421 |
| Southport Corp. ... | „ 8 | 1,198 | 1,206 | + 8 | 31½ | 43,875 | — 633 |
| „ Motor Buses ... | „ 8 | 317 | 356 | + 39 | 31½ | 14,034 | + 1,236 |
| „ Total ... ... | „ 8 | 1,515 | 1,562 | + 47 | 31½ | 57,909 | + 603 |
| St. Helens Corp. ... | „ 4 | 1,951 | 2,162 | + 211 | 31¼ | 64,192 | + 3,191 |
| Sunderland Corp. ... | „ 11 | 2,350 | 2,116 | — 234 | 32 | 78,584 | — 913 |
| „ Motor Buses ... | „ 11 | 239 | 698 | + 459 | 32 | 19,815 | + 12,537 |
| „ Total ... ... | „ 11 | 2,589 | 2,814 | + 225 | 32 | 98,399 | + 11,624 |
| Swindon Corp. ... | „ 5 | 796 | 937 | + 141 | 31¾ | 31,113 | + 5,850 |
| Wallasey Corp. ... | „ 8 | 1,186 | 1,126 | — 60 | 31½ | 39,951 | — 3,280 |
| „ Motor Buses ... | „ 8 | 1,838 | 1,967 | + 129 | 31½ | 76,050 | + 7,116 |
| „ Total ... ... | „ 8 | 3,024 | 3,093 | + 69 | 31½ | 116,001 | + 3,836 |
| Walsall Corporation... | „ 2 | 3,418 | 3,952 | + 534 | 31 | 109,097 | + 2,944 |
| Walthamstow Corp. ... | „ 8 | 2,409 | 2,380 | — 29 | 31½ | 78,823 | — 488 |
| Warrington Corp. ... | „ 6 | 897 | 915 | + 18 | 32 | 28,488 | + 235 |
| „ Motor Buses ... | „ 6 | 461 | 526 | + 65 | 32 | 16,158 | + 1,792 |
| „ Total ... ... | „ 6 | 1,358 | 1,441 | + 83 | 32 | 44,626 | + 2,027 |
| West Ham Corp. ... | „ 6 | 6,200 | 5,891 | — 309 | 31½ | 189,995 | — 1,400 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | „ 2 | 2,732 | 2,313 | — 419 | 31 | 76,051 | — 11,198 |
| „ Trolley Buses ... | „ 2 | 3,365 | 3,648 | + 283 | 31 | 108,079 | + 4,320 |
| „ Total ... ... | „ 2 | 6,097 | 5,961 | — 136 | 31 | 184,130 | — 6,878 |
| York Corporation ... | „ 5 | 1,005 | 975 | — 30 | 32 | 33,134 | — 690 |
| „ Motor Buses ... | „ 5 | 439 | 580 | + 141 | 32 | 16,501 | + 3,898 |
| „ Trolley Buses ... | „ 5 | 68 | Nil | — 68 | 32 | Nil | — 1,769 |
| „ Total ... ... | „ 5 | 1,512 | 1,555 | + 43 | 32 | 49,635 | + 1,439 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Wks. or *M* | Aggregate. 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Nov. 11 | £87,553 | £80,128 | 45 w | £3,681,854 | — £200,975 |
| Brazilian Traction $ | Sept. | 4,225,416 | 3,906,162 | 9 *m* | 36,066,347 | — 865,449 |
| British Columbia $ | Sept. | 1,169,278 | 1,206,579 | 3 *m* | 3,597,208 | + 102,457 |
| Buenos Aires Lacroze | Nov. 9 | 12,388 | 12,222 | 10 w | 209,738 | — 12,546 |
| Burma E. Sup. Co. Rs. | Sept. | 59,467 | 65,852 | 2 *m* | 132,270 | + 11,494 |
| Calcutta ... Rs. | Nov. 8 | 127,402 | 106,314 | 44½ w | 4,903,635 | — 744,094 |
| Cape Town ... ... | Sept. | 26,579 | 24,295 | ... | ... | ... |
| Carthagena & Herrerias | Oct. | 1,053 | 559 | 10 *m* | 7,851 | — 2,852 |
| Durban Corporation | Sept. | 22,371 | 21,156 | 2 *m* | 46,227 | — 1,763 |
| East India ... ... | Oct. | 4,078 | 3,809 | 3 *m* | 11,488 | — 868 |
| Kalgoorlie ... ... | July | 1,664 | 1,776 | 7 *m* | 11,662 | + 137 |
| Madras (2 weeks) Rs. | Oct. 31 | 41,430 | 41,082 | 42 w | 927,614 | + 48,878 |
| Para ... ... | Oct. | 17,887 | 12,110 | 11 *m* | 155,610 | — 10,803 |
| Port Elizabeth ... | Sept. | 7,190 | 6,670 | ... | ... | ... |
| Rangoon ... Rs. | Sept. | 122,850 | 147,775 | 9 *m* | 1,345,030 | + 267,189 |
| Shanghai ... $ | Oct. | 371,611 | 415,900 | 10 *m* | 3,543,658 | + 175,998 |
| Singapore ... ...$ | Sept. | 126,000 | 140,000 | 12 *m* | 1,650,000 | + 179,000 |
| Winnipeg ... ...$ | Sept. | 518,521 | 484,609 | 9 *m* | 4,656,233 | — 194,943 |

## RAILWAY RECEIPTS.

| 45th Week ended Nov. 9th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 188,000 | — 8,000 | 317,000 | — 34,000 | 505,000 | — 42,000 | -1,245,000 |
| L.M.S.R. | 432,000 | — 26,000 | 787,000 | — 111,000 | 1,219,000 | — 137,000 | -4,292,000 |
| L.N.E.R. | 296,000 | — 7,000 | 662,000 | — 58,000 | 958,000 | — 65,000 | -2,816,000 |
| S.R. | 265,000 | — 7,000 | 92,000 | — 11,000 | 357,000 | — 18,000 | — 536,000 |
| Totals | 1,181,000 | — 48,000 | 1,858,000 | — 214,000 | 3,039,000 | — 262,000 | -8,889,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Nov. 8 | 295,300 | 301,900 | + 6,600 | 13,580,800 | + 699,200 |
| Lond. & Sub. Group | „ 8 | 43,200 | 43,900 | + 700 | 2,000,300 | + 108,900 |
| Metropolitan Railway | „ 8 | 37,500 | 35,900 | — 1,600 | 1,641,800 | + 10,600 |
| Liverpool Overhead | „ 9 | 1,574 | 1,408 | — 166 | 70,145 | — 6,088 |
| Mersey Railway ... | „ 8 | 4,584 | 4,436 | — 148 | 203,784 | + 3,504 |

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LONDON, NOVEMBER 22, 1930.

## MUNICIPAL INSPECTION OF THE ACRO ENGINE.

More than ordinary importance attaches to the fact that on November 14 the Council and a number of members of the Municipal Tramways and Transport Association, who were attending various meetings in London, accepted an invitation of the Associated Equipment Co. to visit their Southall works to inspect the new high-speed oil engine now in production. The visit was the first occasion on which the Council of the Association as a body has accepted the invitation of a manufacturer. The acceptance indicated that the visitors take more than a passing interest in Diesel and other oil fuel engines which give promise of reducing existing omnibus costs. It is considered that the reduction may in some cases amount to 2d. per mile. The figure is corroborated by those put forward by Mr. Vane Morland in the course of his paper at the Harrogate Conference, which was given in full in the issue of this journal of October 16. Mr. Morland gave the fuel cost per mile of various oil-engine omnibuses, running 100 miles per day for 300 days per annum, as .40d., the petrol cost being 2.166d., the saving on fuel equalling £220 per annum. Regarding the cost of petrol per mile, it is of interest to observe that our table of municipal omnibus records published on November 13 gives an average of 2.529d. Such figures warrant the fullest investigation by managers of the progress which has been attained by the A.E.C. and other manufacturers. Actual demonstration of the engine was given by the A.E.C., who conveyed the visitors from London to Southall in omnibuses fitted with petrol and oil engines, a stop being made on the way in order that the passengers might change vehicles and thus compare the operation of the two engines under similar conditions. The claims of the Acro, as perfected by the A.E.C. for public passenger and lorry work, are to be found in an illustrated article in our issue of November 13. Corroboration of the evidence there given was provided by Mr. J. G. Shave, operating manager and chief engineer of the London General Omnibus Co., in the paper which he read last week at a joint meeting of the Institute of Transport and the Institution of Automobile Engineers. Mr. Shave referred to the Acro, the Mercedes Benz and the Junkers as having given "a very satisfactory performance." It is open to any transport authority to test any of the engines which we have named, and others might be added to the list, notably those which are available through Aveling & Porter, Ltd., and John I. Thornycroft, Ltd.

## BRIGHTON TRANSPORT SCHEME.

The Corporation of Brighton has approved the promotion of a Bill, either alone or jointly with the Hove Corporation and Thomas Tilling, Ltd., or either of them, for incorporating a General Transport Board consisting of representatives appointed by Brighton Corporation, Hove Corporation and Messrs. Tilling. The duties of the Board would be the maintaining and working of the tramways, and providing and running tramcars and other public service vehicles within the district comprising the boroughs of Brighton and Hove, the urban districts of Portslade-by-Sea and Southwick, and part of the urban district of Shoreham. The Bill provides also for the transfer to the Board, without payment, of the tramways undertaking of the Brighton Corporation, and the Brighton and Hove section of the omnibus business of Thomas Tilling, Ltd., and the payment by Hove Corporation of a sum of £100,000. The Board would be empowered to restrict competition with their services. Provision would be made for the distribution of the profits between Brighton and Hove Corporations and Thomas Tilling, Ltd., in agreed proportions. Hove Council has approved the Bill. They would receive £130,000 worth of shares in the new undertaking. This sum represented one-sixth of the total capital (£780,000) of the proposed Board.

## ORDERS FROM LONDON UNDERGROUND RAILWAYS.

The General Electric Co., Ltd., of Magnet House, Kingsway, London, W.C.2, have received from the London Underground Railways Company an important order for the supply of some 300 heavy traction motors for the new rolling stock required in connection with the Cockfosters-Hounslow extension of the Piccadilly line. This order constitutes the ninth successive order for electric traction equipment received by the G.E.C. from the London Underground in the past few years, and when completed will bring the total of modern heavy railway motors of G.E.C. manufacture in use on Underground cars to nearly 2,000.

The General Electric Co. have also received, through the Birmingham Railway Carriage & Wagon Co., Ltd., the order for the complete electrical equipment of 61 new compartment-type coaches now being constructed to the order of the Metropolitan Railway Company, London. The material to be supplied comprises electric traction, lighting and heating equipment for fourteen each of 4-motor motor coaches, driving trailer coaches, first-class trailer coaches, and 19 third-class trailer coaches. The motor coaches will each have a power output of 1,100 h.p. and each be equipped with four self-ventilated motors rating at 275 b.h.p. on the one-hour rating. The control gear will be of the electro-pneumatic type.

The equipment for both the above orders will be manufactured throughout at the General Electric Co.'s Witton Engineering Works, Birmingham.

## NEW CARS FOR M.E.T. AND L.U.T.

In about a month the first of a new type of tramcar will be put into service on the Metropolitan Electric Tramways and the London United Tramways, both members of the London Underground Group and under the general management of Mr. C. J. Spencer. The new design is the outcome of the decision to construct three experimental cars, each with novel features, with the object of selecting the best points of each and standardising them in one design. These three cars were built by the Union Construction Co., of Feltham. The first was put in operation in the spring of last year, the second in November of last year, and the third in May of this year. The last-mentioned, which is now running between Cricklewood and North Finchley, has a central entrance, but this feature will not be incorporated in the new type, and no more of the central-entrance design will be constructed.

A hundred of the new type are now under construction—54 for the M.E.T. and 46 for the L.U.T.

## DIESEL LOCOMOTIVES FOR SOUTH AMERICA.

AN "ENGLISH ELECTRIC" CONTRACT.

An order received by the English Electric Co. from the Buenos Aires Great Southern Railway is specially interesting, as it deals with Diesel electric traction. The new rolling stock for the railway will include three eight-coach trains, each train having attached to it a self-propelling Diesel electric power-house. For these trains the English Electric Co. will supply 62 motors, each of 135 h.p., and control equipment. Two motors will be mounted on each of the outer bogies of the power-houses, and each motor coach will be driven by two motors, leaving two motors spare.

The English Electric Co. are also supplying six motors and control equipments for a 1,700 h.p. high-speed Diesel electric locomotive, which is under construction. The main contractors for the rolling stock are Messrs. Armstrong, Whitworth & Co., who will also supply the Diesel locomotive.

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## DEATH OF MR. EMILE GARCKE.

SUDDEN END OF A LONG LIFE DEVOTED TO ELECTRICAL ENTERPRISE.

It is with deep regret that we record the sudden death, following pneumonia, on November 14, of Mr. Emile Garcke, at his residence, Ditton Meads, Berkshire, at the age of 74. Mr. Garcke came to England from Germany when a youth, becoming naturalised at the age of 24. In 1883 he was appointed secretary of the Brush Electrical Engineering Co., and ten years later he was elected chairman and managing director. In this capacity he was able to introduce co-partnership with the employees. A year ago, on giving up some of his public activities, he accepted the presidency of the Industrial Co-Partnership Association. It is to Mr. Garcke's generosity that the Association owes its new headquarters in Gordon-square. In 1893, Mr. Garcke, on becoming managing director of the Electric Construction Co., reorganised the company, which carried out many important enterprises. The formation by him in 1895 of the British Electric Traction Co., of which he became managing director, led to a great development of electric tramways, together with electricity supply. Another organisation established by Mr. Garcke was the Electric and General Investment Co. In later years, the B.E.T., as it was familiarly termed, also interested itself in motor omnibus operation, this development being known as the British Automobile Traction Co. Mr. Garcke obtained, at his own cost, the initial powers of the County of London Electric Supply Co., and for twenty years was chairman of the North Metropolitan Electric Supply Co. During recent years he served on the Advisory Joint Electrical Committee. He founded the Electrical Section of the London Chamber of Commerce, and was a vice-president of the Tramways, Light Railways and Transport Association. "Garcke's Manual of Electrical Undertakings" is a monument to his memory. Last year he published a book on philosophy, which was reviewed in this journal. He was one of the founders and hon. treasurer of the British Institute of Philosophy. His widow and son, Mr. Sydney E. Garcke, have received a great number of letters of condolence. Mr. Sydney Garcke is chairman of Tillings and British Automobile Traction, Ltd. The funeral took place on Tuesday last at Golders Green Crematorium, the Rev. H. Trundle officiating.

## MUNICIPAL TRAMWAYS AND TRANSPORT ASSOCIATION.

INSPECTION OF HEAVY OIL ENGINE.

At the invitation of the Associated Equipment Co., Ltd., the Council and a number of members of the Municipal Tramways and Transport Association recently inspected the new high-speed oil engine which is now being produced by the company under the "Acro" licence. The party was conveyed from London to Southall in omnibuses fitted with petrol and heavy oil engines, and a stop was made on the way in order that the passengers might change vehicles and thus compare the respective performances of the two types of engine. Incidentally, the visitors obtained some idea of the congestion of traffic in London streets and the difficulty that attends time-keeping in the running of omnibus services in the metropolis.

The visitors were entertained at luncheon at the Park Hotel, Hanwell, and afterwards at the works. Mr. C. W. Reeve, managing director of the A.E.C., gave a brief but comprehensive description of the history, development and capabilities of the high-speed oil engine, and members of the party then inspected the new unit under the guidance of technical members of the Southall staff. Those present had an excellent opportunity of increasing their knowledge of the progress of the new type of power unit which is bound to play an important part in the future of road transport.

## PICCADILLY TUBE EXTENSION.

Balfour Beatty & Co., Ltd., have begun work on the extension of the Piccadilly Railway from Hammersmith to Northfields. Included in the scheme is the rebuilding of the interior of Hammersmith station and the construction of a covered way under Hammersmith Broadway. Acton Town and Turnham Green stations will undergo alteration. The work is expected to occupy eighteen months, and by that time it is hoped that the extension from Finsbury Park to Cockfosters will be completed, giving a direct run from Hounslow to Cockfosters, across London, of twenty-five miles. The total cost of the two extensions will be £3,000,000.

**Passes to be Discontinued.**—Leeds Tramways and Transport Committee has recommended that the issue of tramway and omnibus passes to members of the City Council should be discontinued. The passes were first issued during the period when Labour was in control.

**"Tramway Motormen's Guide."**—This is the title of a handbook written by Mr. A. Hutcheon Spence, a conductor-motorman in the Dundee Corporation Transport service. Three chapters describe the controller and its functions, brakes and sanding equipment, and the operation and control of tramcar doors, each chapter being well illustrated by photographs and diagrams. A fourth chapter is a reminder of what transport men owe the passenger for his fare, with instructive and useful advice to all tramwaymen. Attention to this book cannot fail to improve the efficiency of both motormen and conductors in the handling of their equipment and in giving satisfaction to the public. Tramway managers will, no doubt, wish to see it in the hands of their men. It is published at 1s. by the Simmath Press, Ltd., Roseangle, Dundee.

## MISCELLANEOUS NEWS AND NOTES.

**Glasgow Transport Committee** has approved plans for a new garage at Knightswood at an estimated cost of £35,000.

**Manchester Electricity Committee** has appointed a sub-committee of five to join the Transport Committee on visits to various towns to inspect trolleybus installations.

**Ashton-under-Lyne Tramways Committee** has decided to allow children up to five years of age to travel free on the Corporation services. Three years has been the age limit hitherto.

**A Derby Route Changed Over.**—The last tramcar on the Nottingham-road route, Derby, ran on November 15, and a service of omnibuses was instituted the following day. Later, trolleybuses will operate the route.

**The Bow Collector for Glasgow.**—Glasgow Transport Committee has agreed to the recommendation of the general manager to advise the Council to adopt the bow-trolley with plate attachment for all the tramcars, in the place of the trolley wheel.

**Cost of Living.**—On November 1 the average level of retail prices of the commodities taken into account in the statistics compiled by the Ministry of Labour was approximately 57 per cent. above the level of July, 1914. A year ago the figure was 67 per cent.

**Scarborough to Seek Transport Powers.**—Scarborough Town Council has decided to promote a Bill the main objects of which will be to empower the Corporation to operate omnibuses and trolleybuses in the town and district, and to purchase the tramway undertaking.

**Proposed Tube Railway to Ilford.**—The Minister of Transport has informed the House of Commons that the L.N.E.R. is considering the report of the engineers appointed to investigate the possibility of constructing an underground railway from Liverpool Street to Ilford.

**Salford Corporation** has discussed preliminary details of a scheme for the reorganisation of its transport services. The idea is to bring all Corporation vehicles under the control of one head. A sub-committee is investigating the matter with a view to effecting the greatest possible economy.

**Sheffield Christmas Day Service.**—The Sheffield Tramways Committee recommends the operation of a skeleton service of tramcars and omnibuses on Christmas Day, from 10 a.m. till 1 p.m., and from 6.30 till 10 p.m. No Christmas Day services have been run in Sheffield since 1917.

**York Trolleybus Extension.**—York City Council has decided to apply for a Provisional Order authorising the extension of the trolleybus route from the junction of Piccadilly with Pavement to Fulford-road. A proposal to extend the system to the football ground at Fulford-gate was referred back.

**Seven Months to Sanction an Omnibus Loan.**—After seven and a half months' delay West Bridgford Urban Council has received Ministerial sanction to borrow £1,750 for the purchase of a new omnibus. Meantime the omnibus was being paid for out of revenue. The sanction was accepted, and the loan is to be repaid in eight years.

**Lancashire Trolleybus Proposal.**—The Lancashire United Transport Co. is stated to be considering a scheme for converting the tramways at Kearsley, near Bolton, to railless electric traction. In August last the Hon. Sir Arthur Stanley opened the company's first trolleybus route between Atherton and Ashton-in-Makerfield.

**Driving Tests.**—Details of the driving tests prescribed in the Road Traffic Act for applicants for motor vehicle licences who suffer from certain physical disabilities are given in the Motor Vehicles (Driving Licences) Regulations, 1930, dated November 17, which have been made by the Minister of Transport and come into force on December 1.

**Coach Restriction in London.**—It is stated that the Minister of Transport has no intention of banning motor coaches from any part of London. Proposals before the Minister and various committees are designed to regulate coach traffic rather than to ban it, but it is possible that there will be a limit on the number of coaches plying for hire in the congested London area.

**New Services Through Cheltenham.**—The application of the International Express Services for three omnibus licences for a proposed Newcastle via Sheffield service, has been granted by the Cheltenham Watch Committee, subject to the route through the borough, stopping places and drivers being approved. The Committee has also granted the application of Black & White Motorways, Ltd., for 18 additional omnibus licences.

**Proposed Change to Motor 'Buses at Lowestoft.**—Lowestoft Transport Committee recommends that, if possible, the change over from tramcars to motor omnibuses shall be put into operation in April next. The general manager has been authorised to visit other towns where omnibuses are in operation and to report as to the class of vehicle best suited to meet local conditions. The Committee proposes to seek sanction to borrow £10,000 for the removal of tramway track and road reconstruction, and £18,500 for the provision of motor omnibuses.

**Prizes for Papers on Transport.**—The first and second prizes for papers selected for discussion at the Public Works, Road and Transport Congress and Exhibition have been increased by 50 and 20 guineas respectively. These prizes will therefore be: 1st, gold medal and 100 guineas; 2nd, silver medal and 50 guineas. Papers must deal with one of the subjects covered by the objects of the Congress, including highways, tramways and light railways. December 31 is the last day for the receipt of papers by the hon. secretary of the Congress, 84, Eccleston-square, London, S.W.1.

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**Saved by Life-Guard.**—A woman who fell in front of a Manchester tramcar was saved by the life-guard, which was promptly operated by the driver. The car had to be jacked to free her, but she was only slightly injured.

**Bournemouth to Consider Trolleybuses.**—Members of Bournemouth Tramways Committee are to visit Wolverhampton on November 27 and 28 to inspect the trolleybus system in the borough. At a meeting of the Corporation, when the visit was sanctioned, Alderman H. E. Beale repudiated a suggestion that the cost of the visit would be a waste of money when they were considering a capital outlay running into many thousands of pounds.

**Joint Municipal Parcel Service.**—The general manager of Oldham Corporation Tramways, in a report to the Committee with reference to the proposal for long-distance parcel services, states that arrangements had been discussed for the introduction of a joint parcel service between Leeds, Bradford, Huddersfield, Oldham, Manchester, Liverpool, and other places. The Committee agreed that, subject to satisfactory arrangements being reached, the scheme should be put into operation.

**Successful Test of Glasgow Diesel Omnibus.**—An omnibus, fitted with a crude oil engine, has been submitted to a severe test by Glasgow Transport Committee, and is reported to have come through very successfully. It was stated that the engine gave almost complete freedom from fumes and knocking, and had plenty of power in reserve. It is of the A.E.C. type, and the omnibus was brought specially from London for the trial. A similar vehicle will shortly be in service in Glasgow.

**Motor Vehicles and the New Act.**—Speaking at the annual meeting of John I. Thornycroft & Co., Ltd., on Wednesday, Sir John E. Thornycroft, K.B.E., managing director, said that the market at home for motor vehicles would be to some extent affected by the new Road Traffic Act. In addition to defining and limiting speeds for different classes of vehicles, it definitely limited axle loads. In anticipation of the Act, the company had in production new models complying with the provisions, as they were informed that the new regulations would be more strictly enforced, and users would not be able to run vehicles which were flagrantly illegal as regards axle weights.

**Kingsway Tramway Tunnel.**—An official of the London County Council engineering department, referring to the reconstruction of the Kingsway subway to enable it to be used by double-deck cars, has stated that the undertaking was a difficult one, but the contractors had not encountered any unforseen difficulties. To-day they were within sight of finishing the work without accident to any of the 500 workmen employed. The minimum height of the reconstructed tunnel is 16 ft. 6 ins., the reinforced concrete walls are 7 ft. thick, and under the track there is a depth of 5 ft. of concrete. Two model stations have been built at Holborn and Aldwych. These are tiled throughout, the former in a brown effect, and Aldwych in green.

**Blackpool Corporation Omnibuses.**—Commenting on a net loss of £16,883 on the omnibus services during the past financial year, Mr. C. Furness, general manager of Blackpool Corporation Transport, states that many of the routes have not earned sufficient revenue to meet working expenses. It is hoped to make a substantial saving in mileage and operating costs, with an appreciable increase in revenue per omnibus mile, during the ensuing financial year. The policy of the Transport Committee in providing in advance omnibus travelling facilities remote from the tramways will, he says, eventuaally prove invaluable to the Corporation and ratepayers, especially when the Traffic Commissioners come to consider the granting or withholding of licences.

**Opening of Leigh's New Garage.**—The new garage, workshops and offices for the motor omnibus department at Leigh, Lancs, were opened on November 13. The Mayor, Councillor W. Higenbottam, opened the premises with a gold key handed to him by Alderman T. Grundy, chairman of the Motor Omnibus Committee. The building covers an area of 4,643 square yards, and has been adapted at a cost of £10,488. There is accommodation for 53 omnibuses, besides workshops, offices, stores, and mess and recreation rooms. The work was designed and supervised by the borough engineer and surveyor, Mr. T. A. Clare. The Hammond low pressure petrol installation was supplied by the Equipment and Engineering Co., Ltd., London, and the high pressure washing plant by Brown Bros., Ltd., of Manchester. The fleet at present numbers 29, and the omnibus manager is Mr. F. Lythgoe.

**Traffic at the Elephant and Castle.**—The second reading of the Bill promoted by the London County Council for traffic improvements at the Elephant and Castle was carried in the House of Commons on Wednesday without a division. Mr. Isaacs (Lab., North Southwark) moved its rejection on the grounds of unsuitability, cost, unreasonable hardship, and the urgent need of housing accommodation in the area. He urged the alternative scheme, which would be less costly, be more efficient for dealing with traffic, and involve the destruction of fewer properties. The reconstruction was almost exclusively the making of roads and taking up and relaying tramway tracks. There was no provision for the housing of some 350 families affected. Sir C. Cobb said the County Council was doing everything to meet specific objections. There would be a proper and satisfactory system of subways. Mr. Morrison, Minister of Transport, begged the House to have some finality in the matter and to support the experts, who had carefully considered and approved the scheme. Primarily, the scheme was needed, not on tramway grounds, but on general traffic grounds.

## PERSONAL.

**Alderman A. H. James** has been reappointed chairman of Birmingham Tramways and Omnibus Committee.

**Alderman Graham Ford,** recently vice-chairman, has been appointed chairman of Leeds Transport Committee.

**Mr. J. Milne, C.S.I.,** general manager of the Great Western Railway, has been elected a member of the council of the Institute of Transport.

**Mr. W. V. Wood,** vice-president of the London, Midland and Scottish Railway, has been appointed honorary librarian of the Institute of Transport.

**Alderman R. J. Barwick** has been re-elected chairman of the Dover Corporation Tramways Committee, and Councillor G. M. Norman vice-chairman.

**Councillor F. C. Wilson** and **Alderman P. J. Kelly** have been re-elected chairman and deputy-chairman, respectively, of the Liverpool Tramways and Electric Power and Lighting Committee.

**Councillor C. A. Henderson,** chairman of South Shields Tramways Committee, has been elected Mayor of the borough. He has been a member of the Corporation since 1913, and has been secretary of the Tyne Dock branch of the National Union of Railway Servants for 29 years. For his work during the war he was made an M.B.E., and a year later he was appointed a borough magistrate. He has been a magistrate at Jarrow since 1908.

## FINANCIAL ITEMS.

**Increased Revenue at Glasgow.**—Since the beginning of the financial year on June 1, Glasgow Transport Department has carried 10½ million passengers on its tramways, omnibuses and subway. The revenue for the same period totalled £1,294,846, or more than £80,000 compared with the corresponding period a year ago.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended November 19 amounted to £80,963, an increase of £370 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to November 19 (33 2-7 weeks) the total receipts were £2,755,397, a decrease of £29,632.

**Blackpool Corporation Transport.**—The annual report of Mr. Charles Furness, the general manager, for the year ended March 31, shows a net profit of £21,933 on the tramways and a net loss of £16,883 on the omnibuses. The total income was £375,896 and the working expenses £286,394. The tramcars carried 48,096,731 passengers, compared with 47,194,155 the previous year, the receipts being £308,234 compared with £309,855, and the car mileage 3,467,801, compared with 3,476,753. Omnibus passengers numbered 8,791,032, against 10,054,103, and the receipts were £64,892, against £67,293.

**Blackburn Corporation Tramways.**—A report presented to the Tramways Committee shows that all the capital expenditure on the tramways, amounting to £342,000, has been repaid, and, in addition, various expenditure has been made out of revenue, totalling £109,245. This sum includes £60,000 paid in aid of rates, of which £10,000 was in the last financial year. When Mr. J. H. Cowell became manager in 1906, there had been losses amounting to £34,000, but since that date the profits have totalled £126,454, the profit last year being £17,695. Pioneer omnibus services have recently been added, and the result so far has been satisfactory.

**John I. Thornycroft & Co., Ltd.,** show a decline in net profit from £129,701 for 1928-29 to £95,876 for the year ended July 31 last. The dividend on ordinary shares is to be reduced from 17½ per cent. to 13 per cent. This again entitles the holders of the 7½ per cent. participating preferred ordinary shares to their maximum yearly dividend of 9 per cent. The directors also propose to place £20,000, as against £30,000, to reserve, which will raise that account to £275,000, while £5,000 (against £6,000) is to be contributed to the benevolent fund. The carry-forward is reduced from £61,882 to £59,258. The report states that the sales of commercial vehicles, marine motors and motor-boats show an increase in the home market, but a reduction in overseas markets.

## CONTRACTS.

**Thomas Tilling, Ltd.,** have purchased an "Eqwhipple" engine starter from the Equipment and Engineering Co., Ltd.

**Aberdare Corporation** has placed an order for a rail corrugation remover with the Equipment and Engineering Co., Ltd.

**Lisbon Electric Tramways** have placed an order for an electromagnetic crack detector, size B.1, with the Equipment and Engineering Co., Ltd.

**The English Electric Co., Ltd.,** have received an important order in connection with the Lanarkshire hydro-electric scheme, covering the conversion from 25 cycles to 50 cycles of the main generating units at Bonnington and Stonebyres Power Stations. It will be remembered that these water-turbine alternator sets, including two of 7,000 h.p. at Bonnington and two of 4,000 at Stonebyres, together with the complete hydro-electric auxiliaries, were supplied by the English Electric Co. The conversion of one set at Bonnington has already been carried out—the stators of the alternators are being rewound at site, while the rotors will be returned to the Stafford Works for conversion from 8 to 16 poles. It is interesting to note that the Bonnington set was converted within the short space of ten weeks.

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**The British Electrical Federation,** which operates omnibus services in many parts of the country, has made a contract with Russian Oil Products for the supply of petrol. It is reported that the amount involved is twenty million gallons. The contract was placed in competition with the combine companies.

**The Equipment and Engineering Co., Ltd.,** have supplied a Luchard high pressure compressor to the General Motor and Tyre Co., Ltd., of Hammersmith, not Harwich as incorrectly mentioned in our last issue.

**Crossley Motors, Ltd.,** have received a repeat order for six wireless cars from the War Office. A number of these vehicles were supplied in April last to the War Office and also to the Canadian Government for the use of the Canadian R.A.S.C. The basis of the car is the 20-60 h.p. semi-forward control six-wheel chassis, which has a four-cylinder engine. The body is also a Crossley product and is designed to carry an officer, driver and four men, in addition to a comprehensive wireless equipment.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | Latest Return. 1930 | + or — | Aggregate. Wks | Aggregate. 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | Nov. 18 | 663 | 555 | — 108 | 33 | 19,520 | — 126 |
| „ Motor Buses ... | „ 18 | 301 | 324 | + 23 | 33 | 10,012 | + 1,844 |
| „ Total ... ... | „ 18 | 964 | 879 | — 85 | 33 | 29,532 | + 1,718 |
| Aberdeen Corp. ... | „ 12 | 4,387 | 4,468 | + 81 | 23½ | 126,064 | + 2,457 |
| Ashton-u-Lyne Corp. | „ 15 | 898 | 799 | — 99 | 33 | 27,981 | — 2,368 |
| „ Motor Buses ... | „ 15 | 459 | 453 | + 6 | 33 | 16,316 | + 175 |
| „ Trolley Buses ... | „ 15 | 285 | 249 | — 36 | 33 | 8,564 | — 704 |
| „ Total ... ... | „ 15 | 1,642 | 1,501 | — 141 | 33 | 52,861 | — 2,897 |
| Ayr Corporation ... | „ 15 | 428 | 398 | — 30 | 26 | 16,560 | — 1,321 |
| Barrow Corporation... | „ 8 | 521 | 518 | — 3 | 32 | 18,603 | — 1,113 |
| „ Motor Buses ... | „ 8 | 371 | 371 | Nil | 32 | 13,329 | + 643 |
| „ Total ... ... | „ 8 | 892 | 889 | — 3 | 32 | 31,932 | — 470 |
| Belfast City ... ... | „ 14 | 10,895 | 11,172 | + 277 | 32½ | 375,345 | + 11,412 |
| „ Motor Buses ... | „ 14 | 1,210 | 1,348 | + 138 | 32½ | 42,802 | + 8,457 |
| „ Total ... ... | „ 14 | 12,105 | 12,520 | + 415 | 32½ | 418,147 | + 19,869 |
| Birkenhead Corp. ... | „ 16 | 1,496 | 1,364 | — 132 | 33 | 50,063 | — 5,806 |
| „ Motor Buses ... | „ 16 | 3,040 | 3,690 | + 650 | 33 | 124,951 | + 3,249 |
| „ Total ... ... | „ 16 | 4,536 | 5,054 | + 518 | 33 | 175,014 | — 2,557 |
| Birmingham Corp. ... | „ 11 | 27,716 | 25,848 | — 1,868 | 32 | 837,445 | — 44,675 |
| „ Motor Buses ... | „ 11 | 13,803 | 16,588 | + 2,785 | 32 | 500,777 | + 75,772 |
| „ Trolley Buses ... | „ 11 | 588 | 526 | — 62 | 32 | 17,242 | — 717 |
| „ Total ... ... | „ 11 | 42,107 | 42,962 | + 855 | 32 | 1,355,464 | + 30,380 |
| Blackburn Corp. ... | „ 12 | 1,865 | 1,694 | — 171 | 32⅝ | 58,714 | — 5,397 |
| „ Motor Buses ... | „ 12 | 360 | 327 | — 33 | 32¼ | 10,420 | + 9,787 |
| „ Total ... ... | „ 12 | 2,225 | 2,021 | — 204 | 32¼ | 69,134 | + 4,390 |
| Bradford Corporation | „ 15 | 10,072 | 8,851 | — 1,221 | ... | ... | ... |
| „ Motor Buses ... | „ 15 | 3,234 | 3,027 | — 207 | ... | ... | ... |
| „ Trolley Buses ... | „ 15 | 1,045 | 1,893 | + 848 | ... | ... | ... |
| „ Miscellaneous ... | „ 15 | 374 | 273 | — 101 | ... | ... | ... |
| „ Total ... ... | „ 15 | 14,725 | 14,044 | — 681 | 33 | 471,794 | — 18,869 |
| Brighton Corporation | „ 16 | 2,158 | 2,160 | + 2 | 32⅝ | 92,558 | + 1,674 |
| Burnley Corporation... | „ 15 | 2,991 | 2,577 | — 414 | — | — | — |
| „ Motor Buses ... | „ 15 | 660 | 696 | + 36 | — | — | — |
| „ Total ... ... | „ 15 | 3,651 | 3,273 | — 378 | — | — | — |
| Bury Corporation ... | „ 9 | 1,869 | 1,507 | — 362 | 32⅝ | 57,775 | — 8,800 |
| „ Motor Buses ... | „ 9 | 770 | 1,402 | + 632 | 32⅝ | 39,761 | + 22,622 |
| „ Total ... ... | „ 9 | 2,639 | 2,909 | + 270 | 32⅝ | 97,536 | + 13,732 |
| Cardiff Corporation ... | „ 15 | 7,437 | 7,350 | — 87 | 32⅝ | 255,821 | + 1,954 |
| Chester Corporation ... | „ 16 | 397 | Nil | — 397 | 33 | Nil | — 14,505 |
| „ Motor Buses ... | „ 16 | Nil | 647 | + 647 | 33 | 22,087 | + 22,087 |
| „ Total ... ... | „ 16 | 397 | 647 | + 250 | 33 | 22,087 | + 7,582 |
| Chesterfield Corp. ... | „ 17 | 2,008 | 1,878 | — 130 | 33 | 64,021 | + 872 |
| Colchester Corp. ... | „ 19 | 495 | 536 | + 41 | 34 | 20,669 | + 1,982 |
| Colne Corporation ... | „ 12 | 701 | 689 | — 12 | 32 | 22,757 | — 399 |
| Coventry Corporation | „ 16 | 2,094 | 1,849 | — 245 | 33 | 63,987 | — 6,271 |
| „ Motor Buses ... | „ 16 | 1,725 | 1,795 | + 70 | 33 | 59,046 | + 6,100 |
| „ Total ... ... | „ 16 | 3,819 | 3,644 | — 175 | 33 | 123,033 | — 171 |
| Darlington Corp ... | „ 15 | 993 | 1,003 | + 10 | 32⅞ | 34,768 | + 2,519 |
| Derby Corporation ... | „ 15 | 2,552 | 2,354 | — 198 | 33 | 80,345 | — 2,958 |
| „ Motor Buses ... | „ 15 | 830 | 923 | + 93 | 33 | 30,322 | + 5,926 |
| „ Total ... ... | „ 15 | 3,382 | 3,277 | — 105 | 33 | 110,667 | + 2,968 |
| Dover Corporation ... | „ 15 | 359 | 363 | + 4 | 33 | 14,517 | + 461 |
| Dundee Corporation... | „ 4 | 2,586 | 2,487 | — 99 | 24⅞ | 63,341 | — 2,150 |
| „ Motor Buses ... | „ 4 | 835 | 1,147 | + 312 | 24⅞ | 28,264 | + 7,343 |
| „ Total ... ... | „ 4 | 3,421 | 3,634 | + 213 | 24⅞ | 91,605 | + 5,193 |
| East Ham Corp. ... | „ 15 | 2,306 | 2,212 | — 94 | 32⅞ | 74,857 | — 68 |
| Edinburgh Corp. ... | „ 8 | 14,370 | 14,359 | — 11 | 25⅞ | 379,599 | + 6,131 |
| „ Motor Buses ... | „ 8 | 3,493 | 3,752 | + 259 | 25⅞ | 96,431 | + 7,404 |
| „ Total ... ... | „ 8 | 17,863 | 18,111 | + 248 | 25⅞ | 476,030 | + 13,535 |
| Exeter Corporation ... | „ 19 | 775 | 662 | — 113 | 34 | 26,994 | — 2,556 |
| „ Motor Buses ... | „ 19 | 200 | 381 | + 181 | 34 | 11,585 | + 6,331 |
| „ Total .. ... | „ 19 | 975 | 1,043 | + 68 | 34 | 38,579 | + 3,775 |
| Glasgow Corporation... | „ 15 | 44,972 | 44,106 | — 866 | 24 | 1,042,663 | — 12,220 |
| „ Motor Buses ... | „ 15 | 6,634 | 10,704 | + 4,070 | 24 | 215,470 | + 80,234 |
| „ Total ... ... | „ 15 | 51,606 | 54,810 | + 3,204 | 24 | 1,258,133 | + 68,014 |
| Gloucester Corp. ... | „ 12 | 616 | 703 | + 87 | 32⅞ | 23,346 | + 4,426 |
| Grimsby Corporation | „ 15 | 1,427 | 1,503 | + 76 | 33 | 52,912 | + 5,240 |
| Halifax Corporation | „ 11 | 5,041 | 4,893 | — 148 | 32½ | 166,731 | + 17,364 |
| Huddersfield Corp. ... | „ 15 | 6,203 | 6,072 | — 131 | 33 | 210,779 | — 2,031 |
| Hull Corporation ... | „ 15 | 6,078 | 5,655 | — 423 | 33 | 183,553 | — 8,618 |
| „ Motor Buses ... | „ 15 | 1,452 | 1,773 | + 321 | 33 | 53,831 | + 8,439 |
| „ Total ... ... | „ 15 | 7,530 | 7,428 | — 102 | 33 | 243,384 | — 179 |
| Ilford Corporation ... | „ 15 | 1,419 | 1,507 | + 88 | 32⅝ | 49,768 | + 670 |
| Ipswich Corp. Trol.Bus | „ 8 | 1,312 | 1,317 | + 5 | 31½ | 43,553 | + 2,284 |
| Isle of Thanet ... | „ 12 | 380 | 364 | — 16 | 45½ | 38,559 | — 4,573 |
| Kilmarnock Corp. ... | „ 15 | 478 | 486 | + 8 | 26⅞ | 13,094 | + 554 |
| Lancashire Un. ... | „ 9 | 2,247 | 2,128 | — 119 | 44⅞ | 95,515 | — 5,549 |
| „ Motor Buses ... | „ 9 | 4,378 | 4,590 | + 212 | 44⅞ | 222,840 | + 26,940 |
| Leeds Corporation ... | „ 15 | 19,338 | 19,589 | + 251 | 32⅝ | 655,187 | + 10,516 |
| Leicester Corp. ... | „ 15 | 8,490 | 8,420 | — 70 | 33 | 276,057 | — 416 |
| Lincoln Corp. ... | „ 16 | 830 | 830 | Nil | 33 | 31,000 | + 202 |
| Liverpool Corp. ... | „ 15 | 26,698 | 26,375 | — 323 | 32⅝ | 879,667 | — 15,705 |
| „ Motor Buses ... | „ 15 | 3,006 | 3,249 | + 243 | 32⅝ | 108,414 | + 15,268 |
| „ Total ... ... | „ 15 | 29,704 | 29,624 | — 80 | 32⅝ | 988,081 | — 437 |
| London County Coun. | „ 19 | 80,593 | 80,933 | + 370 | 33½ | 2,755,397 | — 29,632 |
| Luton Corporation ... | „ 12 | 386 | 368 | — 18 | 32½ | 13,751 | + 259 |
| Maidstone Corp. ... | „ 13 | 138 | Nil | — 138 | 32½ | Nil | — 6,857 |
| „ Motor Buses ... | „ 13 | 330 | 246 | — 84 | 32½ | 9,073 | — 1,100 |
| „ Trolley Buses ... | „ 13 | 280 | 540 | + 260 | 32½ | 20,013 | + 9,944 |
| „ Total ... ... | „ 13 | 748 | 786 | + 38 | 32½ | 29,086 | + 1,987 |
| Manchester Corp. ... | „ 15 | 35,120 | 32,162 | — 2,958 | 33 | 1,055,889 | — 96,827 |
| „ Motor Buses ... | „ 15 | 4,757 | 9,002 | + 4,245 | 33 | 287,898 | + 124,422 |
| „ Total ... ... | „ 15 | 39,877 | 41,164 | + 1,287 | 33 | 1,343,787 | + 27,595 |
| Middlesbrough Corp. | „ 11 | 1,178 | 922 | — 256 | 32½ | 33,066 | — 3,753 |
| „ Motor Buses ... | „ 11 | 549 | 524 | — 25 | 32½ | 18,276 | + 1,184 |
| „ Total ... ... | „ 11 | 1,727 | 1,446 | — 281 | 32½ | 51,342 | — 2,569 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | Latest Return. 1930 | + or — | Aggregate. Wks. | Aggregate. 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty.Corp. | Nov. 15 | 9,172 | 8,331 | — 841 | 32⅞ | 282,565 | — 48,073 |
| „ Motor Buses ... | „ 15 | 1,802 | 3,569 | + 1,767 | 32⅞ | 106,718 | + 39,658 |
| „ Total ... ... | „ 15 | 10,974 | 11,900 | + 926 | 32⅞ | 389,283 | — 8,415 |
| Newport Corporation | „ 8 | 1,701 | 1,046 | — 655 | 32 | 45,415 | — 7,934 |
| „ Motor Buses ... | „ 8 | 757 | 1,245 | + 488 | 32 | 31,952 | + 7,717 |
| „ Total ... ... | „ 8 | 2,458 | 2,291 | — 167 | 32 | 77,367 | — 217 |
| Northampton Corp. ... | „ 14 | 1,113 | 742 | — 371 | 32½ | 32,221 | — 4,211 |
| „ Motor Buses ... | „ 14 | 663 | 1,054 | + 391 | 32½ | 27,615 | + 5,589 |
| „ Total ... ... | „ 14 | 1,776 | 1,796 | + 20 | 32½ | 59,836 | + 1,378 |
| Nottingham Corp. ... | „ 13 | 6,441 | 5,653 | — 788 | 32½ | 187,890 | — 28,076 |
| „ Motor Buses ... | „ 13 | 2,796 | 3,677 | + 881 | 32½ | 111,142 | + 33,274 |
| „ Trolley Buses ... | „ 13 | 621 | 1,212 | + 591 | 32½ | 39,162 | + 19,734 |
| „ Total ... ... | „ 13 | 9,858 | 10,542 | + 684 | 32½ | 338,194 | + 24,932 |
| Oldham Corporation | „ 15 | 3,559 | 3,262 | — 297 | 34 | 113,732 | — 7,502 |
| „ Motor Buses ... | „ 15 | 1,925 | 1,834 | — 91 | 34 | 66,986 | — 1,367 |
| „ Total ... ... | „ 15 | 5,484 | 5,096 | — 388 | 34 | 180,718 | — 8,869 |
| Plymouth Corp. ... | „ 15 | 3,363 | 3,019 | — 344 | 32⅝ | 119,773 | — 6,015 |
| „ Motor Buses ... | „ 15 | 2,014 | 2,636 | + 622 | 32⅝ | 82,757 | + 17,979 |
| „ Total ... ... | „ 15 | 5,377 | 5,655 | + 278 | 32⅝ | 202,530 | + 11,964 |
| Portsmouth Corp. ... | „ 15 | 3,547 | 3,354 | — 193 | 33 | 141,734 | — 13,276 |
| „ Motor Buses ... | „ 15 | 1,719 | 2,822 | + 1,103 | 33 | 111,582 | + 42,890 |
| „ Total ... ... | „ 15 | 5,266 | 6,176 | + 910 | 33 | 253,316 | + 29,614 |
| Preston Corporation... | „ 12 | 1,743 | 1,588 | — 155 | 32½ | 54,239 | — 2,350 |
| „ Motor Buses ... | „ 12 | 520 | 494 | — 26 | 32½ | 16,857 | + 727 |
| „ Total ... ... | „ 12 | 2,263 | 2,082 | — 181 | 32½ | 71,096 | — 1,623 |
| Rawtenstall Corp. ... | „ 16 | 858 | 634 | — 224 | 32⅞ | 21,299 | — 6,554 |
| „ Motor Buses ... | „ 16 | 509 | 677 | + 168 | 32⅞ | 22,957 | + 5,743 |
| „ Total ... ... | „ 16 | 1,367 | 1,311 | — 56 | 32⅞ | 44,256 | — 811 |
| Reading Corporation | „ 13 | 1,502 | 1,385 | — 117 | 33 | 47,197 | — 2,488 |
| „ Motor Buses ... | „ 13 | 878 | 997 | + 119 | 33 | 33,243 | + 3,242 |
| „ Total ... ... | „ 13 | 2,380 | 2,382 | + 2 | 33 | 80,440 | + 754 |
| Rochdale Corp. ... | „ 15 | 2,803 | 2,182 | — 621 | — | 88,624 | — 7,505 |
| „ Motor Buses ... | „ 15 | 1,582 | 2,138 | + 556 | — | 53,755 | + 1,780 |
| „ Total ... ... | „ 15 | 4,385 | 4,320 | — 65 | .. | 142,379 | — 5,725 |
| Rotherham Corp. ... | „ 17 | 2,664 | 2,714 | + 50 | 33 | 92,160 | + 2,360 |
| Salford Corporation ... | „ 16 | 11,087 | 11,000 | — 87 | 32⅞ | 366,447 | — 2,287 |
| Sheffield Corp. ... | „ 15 | 21,191 | 20,222 | — 969 | 31½ | 969,921 | — 23,623 |
| Southampton Corp. ... | „ 12 | 3,354 | 3,335 | — 19 | 33 | 114,476 | + 2,217 |
| „ Motor Buses ... | „ 12 | 872 | 846 | — 26 | 33 | 28,679 | + 2,792 |
| „ Total ... ... | „ 12 | 4,226 | 4,181 | — 45 | 33 | 143,155 | + 5,009 |
| Southend-on-Sea Corp. | „ 19 | 1,681 | 1,679 | — 2 | 33⅔ | 75,288 | — 3,641 |
| „ Trolley Buses ... | „ 19 | 179 | 232 | + 53 | 33⅔ | 10,782 | + 3,271 |
| „ Total ... ... | „ 19 | 1,860 | 1,911 | + 51 | 33⅔ | 86,070 | — 370 |
| Southport Corp. ... | „ 15 | 1,187 | 1,171 | — 16 | 32½ | 45,016 | — 649 |
| „ Motor Buses ... | „ 15 | 308 | 354 | + 46 | 32½ | 14,388 | + 1,282 |
| „ Total ... ... | „ 15 | 1,495 | 1,525 | + 30 | 32½ | 59,434 | + 633 |
| St. Helens Corp. ... | „ 11 | 2,001 | 2,077 | + 76 | 32½ | 66,289 | + 3,267 |
| Sunderland Corp. ... | „ 18 | 2,295 | 2,018 | — 277 | 33 | 80,602 | — 1,190 |
| „ Motor Buses ... | „ 18 | 270 | 684 | + 414 | 33 | 20,500 | + 12,952 |
| „ Total ... ... | „ 18 | 2,565 | 2,702 | + 137 | 33 | 101,102 | + 11,762 |
| Swindon Corp. ... | „ 12 | 827 | 988 | + 161 | 32⅔ | 32,119 | + 6,011 |
| Wallasey Corp. ... | „ 15 | 1,177 | 1,101 | — 76 | 32⅞ | 41,052 | — 3,356 |
| „ Motor Buses ... | „ 15 | 1,843 | 2,022 | + 179 | 32⅞ | 78,072 | + 7,295 |
| „ Total ... ... | „ 15 | 3,020 | 3,123 | + 103 | 32⅞ | 119,124 | + 3,939 |
| Walsall Corporation... | „ 9 | 3,467 | 3,797 | + 330 | 32 | 112,804 | + 3,275 |
| Walthamstow Corp. ... | „ 8 | 2,409 | 2,380 | — 29 | 31⅝ | 78,823 | — 488 |
| Warrington Corp. ... | „ 13 | 922 | 895 | — 27 | 33 | 28,383 | + 208 |
| „ Motor Buses ... | „ 13 | 481 | 519 | + 38 | 33 | 16,657 | + 1,830 |
| „ Total ... ... | „ 13 | 1,403 | 1,414 | + 11 | 33 | 46,040 | + 2,038 |
| West Ham Corp. ... | „ 13 | 6,272 | 5,917 | — 355 | 32⅞ | 195,913 | — 1,756 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | „ 9 | 2,676 | 2,201 | — 475 | 32 | 78,252 | — 11,674 |
| „ Trolley Buses ... | „ 9 | 3,398 | 3,706 | + 308 | 32 | 111,786 | + 4,628 |
| „ Total ... ... | „ 9 | 6,074 | 5,907 | — 167 | 32 | 190,038 | — 7,046 |
| York Corporation ... | „ 12 | 1,032 | 950 | — 82 | 33 | 34,083 | — 773 |
| „ Motor Buses ... | „ 12 | 478 | 551 | + 73 | 33 | 17,053 | + 3,971 |
| „ Trolley Buses ... | „ 12 | 61 | Nil | — 61 | 33 | Nil | — 1,829 |
| „ Total ... ... | „ 12 | 1,571 | 1,501 | + 70 | 33 | 51,136 | + 1,369 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | Latest Return. 1930 | Aggregate. Wks. or *M* | Aggregate. 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Nov. 18 | £89,900 | £81,045 | 46 *w* | £3,762,899 | — £209,830 |
| Brazilian Traction $ | Sept. | 4,225,416 | 3,906,162 | 9 *m* | 36,066,347 | — 865,449 |
| British Columbia $ | Sept. | 1,169,278 | 1,206,579 | 3 *m* | 3,597,208 | + 102,457 |
| Buenos Aires Lacroze | Nov. 16 | 12,481 | 12,222 | 20 *w* | 221,960 | — 12,805 |
| Burma E Sup. Co. Rs. | Oct. | 62,905 | 64,928 | 3 *m* | 197,198 | + 19,376 |
| Calcutta ... Rs. | Nov. 15 | 125,240 | 105,723 | 45½ *w* | 5,009,358 | — 763,611 |
| Cape Town ... ... | Oct. | 27,501 | 25,312 | ... | ... | ... |
| Carthagena & Herrerias | Oct. | 1,953 | 559 | 10 *m* | 7,851 | — 2,852 |
| Durban Corporation | Sept. | 22,371 | 21,156 | 2 *m* | 46,227 | — 1,763 |
| East India ... ... | Oct. | 4,078 | 3,809 | 3 *m* | 11,488 | — 868 |
| Kalgoorlie ... ... | Aug. | 2,100 | 2,110 | 8 *m* | 13,772 | + 147 |
| Madras (2 weeks) Rs. | Nov. 15 | 43,821 | 45,521 | 44 *w* | 973,135 | + 50,578 |
| Para ... ... | Oct. | 17,887 | 12,110 | 11 *m* | 155,610 | — 10,803 |
| Port Elizabeth ... | Oct. | 7,593 | 6,904 | ... | ... | ... |
| Rangoon ... Rs. | Sept. | 122,850 | 147,775 | 9 *m* | 1,345,030 | + 267,189 |
| Shanghai ... $ | Oct. | 371,611 | 445,900 | 10 *m* | 3,543,658 | + 175,998 |
| Singapore ... ...$ | Sept. | 126,000 | 140,000 | 12 *m* | 1,650,000 | + 179,000 |
| Winnipeg ... ...$ | Sept. | 518,521 | 484,609 | 9 *m* | 4,656,233 | — 194,943 |

## RAILWAY RECEIPTS.

| 46th Week ended Nov. 16th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 183,000 | — 7,000 | 320,000 | — 29,000 | 503,000 | — 36,000 | -1,281,000 |
| L.M.S.R. | 423,000 | — 24,000 | 790,000 | — 91,000 | 1,213,000 | — 115,000 | -4,407,000 |
| L.N.E.R. | 289,000 | — 10,000 | 679,000 | — 67,000 | 968,000 | — 77,000 | -2,893,000 |
| S.R. | 257,000 | — 3,000 | 111,000 | — 2,000 | 368,000 | — 5,000 | — 541,000 |
| Totals | 1,152,000 | — 44,000 | 1,900,000 | — 189 000 | 3,052,000 | — 233,000 | -9,122,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | Latest Return. 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Nov.15 | 277,300 | 305,200 | + 27,900 | 13,886,000 | + 727,100 |
| Lond. & Sub. Group | „ 15 | 40,300 | 44,200 | + 3,900 | 2,044,500 | + 112,800 |
| Metropolitan Railway | „ 15 | 36,700 | 35,900 | — 800 | 1,677,700 | + 9,800 |
| Liverpool Overhead | „ 16 | 1,585 | 1,317 | — 268 | 71,462 | — 6,366 |
| Mersey Railway ... | „ 15 | 4,481 | 4,366 | — 115 | 208,150 | + 3,389 |

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LONDON, NOVEMBER 29, 1930.

## CHRISTMAS DAY SERVICES.

Last week we reported that the Sheffield Tramways Committee had recommended that a skeleton service should be operated on Christmas Day from 10 o'clock in the morning until one in the afternoon, and again from half-past six until ten in the evening. The recommendation has still to be considered by the City Council, but the Transport and General Workers' Union hopes that the decision will be against the proposal. This is not the first time that the matter of Christmas Day services has been debated in Sheffield and elsewhere, but in Sheffield no such service has been operated for the last thirteen years. It is to be hoped that the Council will at last see the wisdom of the principle that private feelings should be subordinate to public necessity, and that they will approve the proposal. The desire of the tramwaymen to spend this particular occasion with their families is easily understood and is laudable; but they should not overlook the fact that they are responsible for an essential service, and that they enjoy the privileges of a sheltered industry which more than compensate them for the absence from home for a few hours even on Christmas Day. Arguments have been advanced that members of the public wishing to travel on this day should either make such arrangements as will render a journey unnecessary or travel by taxicab, and there is a preposterous suggestion that they should travel overnight—in short, that the public should be put to any inconvenience rather than that a few public servants should be at work for a few hours. Many others, in public and private service, have to work on this day, but if their services were withheld for the same reason as that put forward by the tramwaymen, the position of the public would become insupportable. The matter of extra payment scarcely enters into the subject. When Christmas Day operation is decided upon those at work are certainly entitled to receive more than the normal wages, but the question does not depend upon the amount of the payment, but upon whether the services of the tramwaymen are necessary. It is not an unreasonable request that the public who desire to have family gatherings on Christmas Day should be provided with at least some travelling facilities, and those who persist in refusing even the slight services proposed at Sheffield are not acting in the interests of either the public or the workers concerned.

## THE NEW TRAFFIC COMMISSIONERS.

Although no definite appointments have yet been announced, we understand that the names of at least some of the new Traffic Commissioners will be made public within the next few days. The names will be given out as appointments are confirmed so that the new officials may proceed with the organisation of their duties, which will be very responsible and onerous.

At the meeting of the Middlesbrough Watch Committee on Monday, it was announced that the Minister of Transport had offered the appointment of chairman of the Northern Area to Mr. Henry Riches, chief constable of Middlesbrough. The Ministry also asked if the services of Mr. Riches could be placed at their disposal for a few weeks to assist in the preparations of the measures necessary to bring this part of the Act into operation. Mr. Riches has accepted the appointment subject to certain reservations. He has been chief constable of Middlesbrough for 28 years, and was previously at Scarborough.

## LIVERPOOL ORDER FOR TRUCKS AND MOTORS.

The English Electric Co. recently received an important order for twelve pairs of equal wheel tramcar trucks for Liverpool. The trucks will be complete with motors, and it is interesting to note that the order is the outcome of the satisfactory operation of a sample pair of trucks of the special design which was developed by the general manager and engineer of Liverpool Corporation Tramways in collaboration with the English Electric Co.

A special feature is that the motor frame is utilised as the basis of the truck, the motor being mounted between the wheel axles and at right angles to them. The armature shaft is extended at both ends and carries the driving pinions, the latter engaging with a helical bevel wheel mounted on a quill which surrounds the axle.

This arrangement reduces the unsprung weight to that of the wheels, axles, and axle bearings. Moreover, as the motor and quills are fitted with ball bearings and the lubrication of the drive is by oil baths in dust-proof housings, wear and tear, and noise and maintenance are greatly reduced. An important feature for reducing maintenance is the use of only one oil filling aperture at each end of the truck instead of some twenty-eight filling points on a four-motor standard bogie car. The order includes control equipments of the foot-operated electro-pneumatic type for the twelve cars. The total value of the contract is about £25,000.

## LONDON SUBWAY SERVICES.

In order to obtain the maximum traffic value of the communication provided by the deepened tramway subway, which is to be re-opened before Christmas, it has been decided to operate services between points in north-east London and points in south-west and south-east London. Present regulations provide that maximum fares for journeys on one car shall be as follow: Ordinary single, 5d.; ordinary return, 8d.; workmen's return, 6d.; cheap midday, 2d.; children under 14, ordinary, 2d.; children under 14, cheap midday, 1d. The regulation which governs transport facilities limits such issues to journeys between suburban areas and points in central London.

When the subway services are resumed, the effect of the regulation in its present form would be that a passenger on a direct service, say between Highgate and New Cross, would be able to make the return for 8d., ordinary return fare, whereas a passenger making a return journey between Hampstead and New Cross would change cars and pay 1s. The Highways Committee has recommended that this regulation should be amended to provide that maximum fares on the subway services shall be limited to journeys in either direction: (1) between the northern termini and County Hall, and (2) between the southern termini and Bloomsbury (Southampton Row).

## PLYMOUTH EMPLOYEES' NEW CONDITIONS.

After negotiations extending over a period of several months, employees of the Plymouth Corporation Transport undertaking have accepted an agreement as to working conditions which will come into operation at the beginning of the New Year. Terms were settled at the last meeting of the Tramways and Transport Committee, over which Coun. L. R. Lovell Dunstan, the new chairman, presided.

The agreement provides for:

(1) A guaranteed 48-hours' week.
(2) Each week to stand on its own with respect to overtime.
(3) Ordinary days off to be as per the 1922 National Agreement as at present.
(4) The extra night rest day, if worked, to be paid at the standard overtime rates, i.e., time and a quarter for the first two hours and time and a half afterwards. This day to stand on its own.
(5) The agreement dated March 1, 1930, with respect to sick pay to continue.

Under the new arrangement, the men will take a rest day each week instead of every fortnight. In cases of emergency, when the men are required to work on their rest day, they will be paid at overtime rates for the number of hours worked. This agreement at present relates to tramcar drivers and conductors, and is to be reviewed at the end of each six months. A schedule on similar lines for the employees on the omnibuses is to be prepared without delay.

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## TRANSPORT COMMISSION REPORT.

We understand that the final report of the Royal Commission on Transport is about to be signed, and that it will be placed before Parliament within the next week or so. It is believed that the report will contain recommendations for a modified form of co-ordination between road, railway and inland water transport so as to avoid wasteful competition, and that there will be safeguards against the creation of a monopoly.

## MISCELLANEOUS NEWS AND NOTES.

**Accrington Tramways to be Abandoned.**—The Minister of Transport has sanctioned the abandonment of Accrington Corporation's tramways.

**End of Peterborough Tramways.**—On November 15 the tramcars at Peterborough were withdrawn, and the work of lifting the track and remaking the roads has begun.

**Car Heating.**—An experiment is being made in the heating of cars by the Lytham St. Annes tramways. Water heated by electricity is circulated throughout the vehicle by pipes.

**Passengers Cut by Broken Glass.**—A motor coach collided with a tramway standard in Kearsley on November 25, and several passengers were injured by broken glass. The surface of the road was greasy and the coach skidded.

**Sunderland adopts Bow Trolley.**—After experimental running of a car equipped with the Fischer type of bow trolley, Sunderland Tramways Department, acting on the advice of the manager, has decided to install the bow trolley on all its cars.

**Manchester-Altrincham Electrification.**—The "Daily Dispatch" reports that the first trial run of the electrified section of the Manchester-Altrincham Railway will be made within a few days. It is hoped that the line will be ready for service early next year.

**Tramway Junction to be Relaid.**—The tramway lines at Babington-lane junction, Derby, are to be relaid at a cost of about £450, although the cars will shortly be superseded by trolleybuses. The work was considered necessary owing to the possibility of accidents.

**Dundee and District Tramways.**—Negotiations between the Dundee Corporation and the Dundee, Broughty Ferry and District Tramways Co., for the purchase of the company's undertaking, or an arrangement for operating the cars and omnibuses, are stated to be progressing favourably. An official announcement is expected shortly.

**L.C.C. Tramways Map.**—The winter edition of the London tramway pocket map has been issued by the County Council. The map shows 250 miles of tramway (of which 205 miles come within the 1s. ride-at-will ticket rates), time-tables of first and last cars for 32 day services, time-tables of nine all-night services, and journey times and fares.

**Institute of Industrial Psychology.**—Dr. C. S. Myers, who has been director of the Institute since its inception, has asked to be relieved from the duties of directorship, and has been appointed principal in order that he may devote his whole time to research and educational activities. Dr. G. H. Miles, who has been assistant director, has been appointed director, and will take charge of the whole of its practical activities.

**Institution of Automobile Engineers.**—The following papers will be read on December 2 at the Royal Society of Arts, Adelphi, W.C.2: "Some Experiments on the Factors Affecting the Motion of a Four-wheel Vehicle when some of its Wheels are Locked," by Messrs. J. Bradley and S. A. Wood; and "Factors Affecting the Behaviour of Rubber-tyred Wheels on Road Surfaces," by Messrs. J. Bradley and R. F. Allen.

**Railway Wages.**—The directors of the London, Midland and Scottish Railway Company have decided to reduce their fees by 25 per cent. The total amount of the fees of the twenty-three directors has been £34,000 per year. The directors of the Great Western, London and North-Eastern, and Southern Railway Companies have considered the question of a reduction of their fees, and will place proposals before their shareholders at the annual meeting.

**Trolleybuses for Switzerland.**—The British Legation at Berne report that an important inquirer in Switzerland is desirous of receiving full particulars relating to the provision and service of trolleybuses. Firms desirous of offering British-built trolley omnibuses may obtain further particulars upon application to the Department of Overseas Trade, 35, Old Queen-street, London, S.W.1. Reference No. A.X.10524 should be quoted.

**Removal of Tramway Track at Chatham.**—The estimated cost of removing the tramway track at Chatham and of reinstating the roadway is £14,390. A contribution of £1,831 will be received from the Tramways Company and the Ministry of Transport grant will be £8,148. The work is to be carried out by contract. At Gillingham the estimate is £14,760. There will be a credit for setts and rails recovered, and the Ministry of Transport grant will be £8,434.

**Economies at Newcastle.**—Newcastle Transport Committee has appointed a sub-committee to consider a rearrangement of the tramway services in the Heaton area. To re-route certain cars, it is suggested that a reduction could be effected in the number of cars in service. The Committee may later undertake an investigation of all the tramway services in the city in an effort to secure the use of fewer cars without any decrease in efficiency. It is estimated that for every car withdrawn, operating expenses would be reduced by £1,000 a year. Optimists on the sub-committee are hopeful of effecting a reduction of £10,000. Notable economies were effected in operation in the year ended March last. Calculated on a mileage basis, the reduction amounts to nearly £15,000 on the preceding year. An appeal is being made to the public for co-operation in quicker loading and unloading.

**Glasgow and Regenerative Control.**—Mr. L. Mackinnon, general manager of Glasgow Corporation Transport, has submitted to the Transport Committee a report of the deputation which visited Paris recently in connection with regenerative control. The deputation came to the conclusion that the adoption of regenerative control would mean a considerable saving on the running costs of tramcars where electric current was expensive, but in Glasgow, where the department used its own electric current, the saving would be less.

**Manchester All-Night Services.**—On learning that there was a loss of £68,000 on the all-night tramcar and omnibus services, and tha the average annual loss was £4,000, Manchester Transport Committee has recommended that fares on these all-night services be doubled. At present, passengers are carried at pre-war rates. The proposal is that ordinary fares to all destinations shall be doubled, but "bona-fide workmen" using the all-night routes cars would be given the opportunity of purchasing weekly 6d. permits entitling them to travel at the present fares.

**New Omnibuses for Manchester.**—Manchester Transport Committee has decided to recommend the purchase of fifty covered-top omnibuses at an estimated cost of £82,000. The Corporation now has 162 single-deck and 101 double-deck omnibuses, and the proposed addition will bring the total to 313. Mr. R. Stuart Pilcher, general manager of the Transport Department, reported that forty new omnibuses would be needed for the Altrincham—Sale route, and recommended a margin of ten more for future developments. It is proposed to extend the Parrs Wood garage at a cost of about £50,000.

**Future of Middlesbrough Transport.**—At a meeting of the Middlesbrough Tramways Committee on November 26, a sub-committee that has been negotiating with the L.N.E. Railway as to the future of the local transport services presented a report. Mr. T. Hornsby, divisional general manager of the L.N.E. Railway, has, it is stated, offered to run omnibuses of the United Automobile Co., Ltd., on all transport services within the borough, and to pay annually one-half of the loan charges on the Corporation's loans. It is understood that the offer was declined, and that it was decided to discontinue further negotiations.

**Progress of the Road Oil Engine.**—Major W. H. Goddard, A.M.I.Mech.E., on November 21 read a paper to the Diesel Engine Users' Association at Caxton Hall, London, on "Progress in the Application of the Diesel or Heavy Oil Engine to Road Transport." The chair was occupied by Mr. A. W. A. Chivers, and some fifty members were present. The author remarked that the greatest development of the oil engine would be with omnibuses, for the reason that they ran large and steady mileages, and therefore showed the great economy and other advantages of the Diesel engine more than any other vehicle. The engine, he said, was well on the way to oust the petrol engine.

**Passing Stationary Tramcars.**—The town clerk of Nottingham, Mr. W. J. Board, has replied to a correspondent stating that the Corporation has no power to make a by-law preventing motor vehicles from passing stationary tramcars. The Bill promoted by the Corporation in 1929 contained a clause giving that power, but it was strongly opposed. As Parliament had struck out similar clauses in other Corporations' Bills, and there was a probability that the whole Bill would be blocked on second reading, and its passing jeopardised, the clause was reluctantly withdrawn. Glasgow obtained power to make such a by-law by an Act of 1912, and other Scottish towns have similar powers.

**Bow Collector for Glasgow.**—The bow collector which Glasgow Transport Department proposes to adopt has been used experimentally in Glasgow for the past five years, and is already in use on 130 cars. The results have been smoother running and greater safety on curves, and generally the operation is more satisfactory than with the trolley arm and wheel. The bow does not leave the wire, the cars are never in darkness at turning points, there is no whistling from the trolley wheel, and no sparking from the bow. The bow collector has been largely used in Birmingham, but it is claimed that Glasgow is the first to adopt the bow throughout the entire tramways. The conversion of seventy cars and thirty miles of overhead route to bow collection was described and illustrated in THE TRAMWAY AND RAILWAY WORLD of May 16, 1929, the author of the article being Mr. H. M. Dudgeon, of Birmingham Corporation Tramways and Omnibus Department.

**Bradford Tramway Reorganisation.**—The first instalment of a long report prepared by Mr. C. J. Spencer, general manager of the Tramways of the London Underground group, who was formerly manager of the Bradford Corporation Tramways, has been received by Bradford Tramways Committee. His advice, it will be remembered, was sought by the Committee on the resignation of Mr. R. H. Wilkinson through ill-health. Mr. Walter Hodgson, chairman of the Committee, has stated that the information in the report will be made public when the document is complete. The report has not yet been published, but it is stated that one of the main changes of policy recommended is the substitution of long-distance trolleybus lines for tramways. The cost of the tramcars per car-mile is said to be 1s. 6½d., whereas that of the trolleybus is given as slightly over 1s. 2d., nearly ½d. per mile less than petrol omnibuses. The chief aim of the Committee is to effect economy in administration. About 100 employees have already been dismissed, and salary cuts and service restrictions are probable. The loss on the working of the department for the year ended March 31, 1930, was £29,962, and for the current year it is expected to be even greater. There is likely, it is reported, to be some difficulty in avoiding a call on the rates in the coming year.

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**Tramcars Safest in U.S.A.**—According to a report of the Massachusetts Governor's Committee on Street and Highway Safety, tramcars are twenty-two times safer and trains thirteen times safer than motor cars for travelling in the United States.

**Services to Alexandra Palace.**—The Metropolitan Electric Tramways, Ltd., are being urged by the Alexandra Park Trustees, through the Middlesex County Council, to consider immediately linking up the Hornsey and Wood Green tramway routes, and the possibility of extending the omnibus services into the Alexandra Palace grounds.

**Omnibuses at Stockton.**—Stockton tramway employees who are displaced by the change over to omnibuses which will take place in the next two years are to be transferred as far as possible to the omnibuses. The chairman of the Omnibus Committee, Ald. E. Pickworth, has stated that those not taken over will be found work in other departments of the Corporation. A preliminary service of omnibuses is to be begun shortly between Norton Green and Middlesbrough. Other new services will be provided later. The drivers of the tramcars are being trained as omnibus drivers.

**Powers of the Traffic Commissioners.**—Earl Russell (Parliamentary Under-Secretary for India), in giving evidence at the House of Lords on November 26, before the Committee which is considering the powers of Ministers of the Crown, referred to the powers delegated to the Traffic Commissioners under the new Road Traffic Act. The Commissioners, he said, would have power even to regulate the routes of omnibuses or to prevent omnibuses from running. He thought that power very considerable to be delegated to two or three men, and as far as he knew there was no appeal at all from the decision except to the Minister of Transport.

**Drumm Battery Development.**—In the Irish Free State Parliament on Wednesday, Mr. McGilligan (Minister for Industry and Commerce) moved a vote of £25,000 to develop Dr. Drumm's invention of an electric storage battery for railway traction. Over £9,000 has already been expended on the battery, and the Minister said that about £50,000 would be needed. Railway uses were being concentrated upon without ruling out road vehicles. At the tests last summer nobody questioned the practicability of the invention, and it was now to be applied to two rail coaches, each seating 100 passengers, and capable of a maximum speed of 50-60 m.p.h. The invention would show an amazing reduction of cost compared with third rail electrification.

**Facts About British Railways.**—In an attractive brochure of 32 pages the British Railways Press Bureau, 35, Parliament-street, London, S.W.1, present facts and figures about the British railways which will impress the public and help in the preservation of good relations with the railways. It will also be useful for reference. The railway industry is the largest private undertaking in the country, with a capital of nearly £1,100,000,000 and an income of over £200,000,000. Among the facts mentioned is that the railways are facing the problem of rail and road co-ordination in a practical manner. On the passenger side they are relying mainly upon co-operation and agreement with independent omnibus companies, and they are now directly interested in a fleet of about 8,000 passenger motor vehicles.

**The New Chairman at Hull.**—Councillor J. G. Hewett, the new chairman of Hull Corporation Tramways Committee, in presiding at the first meeting, said he intended to be perfectly straight and open, and asked that each member of the Committee should be the same with him. He did not want anything done behind anyone's back or behind the back of the Committee. If there was any spying, it would have to stop. He wanted to have as little as possible of what were called "hush hush" committees except when dealing with personnel and matters between the Committee and its officials. The Committee afterwards sat in private, when it was understood that it considered the position created by the recent resolution of the City Council asking the tramways manager (Mr. E. S. Rayner) to resign and his refusal to do so. It is thought that the actions for alleged slander by Mr. Rayner against Alderman R. W. Wheeldon and Alderman A. Stark will not be heard for three months. Independents on Hull City Council increased their majority to ten as the result of six by-elections which took place on November 24. All the Labour nominees were defeated. The Independents now hold 47 seats and Labour 37.

**A.E.C. Overseas Models.**—Yesterday (Friday) there was an inspection at the Southall Works of the Associated Equipment Co., Ltd., of the commercial and public passenger vehicle models which the company has developed specially to meet arduous overseas conditions. This deeply interesting display of the company's enterprise is the outcome of their investigations during the past two years in India, Australia, New Zealand, the Federated Malay States, the whole of South America, and Northern Europe. The models on view were the 110 h.p. special 19-ft. wheel base "Ranger" single-deck omnibus or coach chassis, a 3½ ton "Mercury" for city haulage work, and an "Aclo" 4-tonner fitted with A.E.C. power unit designed for traversing country impassable to an ordinary four-wheeler. "Aclo" is the trade mark under which all A.E.C. products are marketed in South America and Germany. Also available for inspection was the A.E.C. new high speed oil engine, which has recently created great interest in the transport industry, and was described and illustrated in THE TRAMWAY AND RAILWAY WORLD of November 13. The exhibits were viewed by many representatives of foreign consulates in London who were evidently impressed by them. The Associated Equipment Company is to be heartily congratulated on its enterprise in bringing suitable machines for service overseas to the notice of the world.

## PERSONAL.

**Ald. Salisbury** has been re-elected chairman of Derby Transport Committee, and **Ald. Sturgess** vice-chairman.

**Leicester Tramways Committee** has accepted the tender of the British Thomson-Houston Co., Ltd., for the supply of 40 h.p. tramcar motors at £196 each.

**Mr. L. R. Lovell Dunstan** has been appointed chairman of Plymouth Tramways and Transport Committee, and **Mr. F. D. Baxter** has been appointed vice-chairman.

**Sir John Timpson** has for the third year been unanimously re-elected chairman of the National Joint Industrial Council for the tramway industry, and Mr. John Cliff has been re-elected vice-chairman.

**Mr. H. W. Swann,** an electrical inspector of the Factory Department of the Home Office, has been appointed to succeed to the post of senior electrical inspector of factories on the retirement of Mr. G. Scott-Ram on December 1.

**Bradford Tramways Management.**—The Tramways Reorganisation Committee has selected from the thirty-eight applicants for the post of general manager of the undertaking a short list of six candidates. The names were not revealed.

**Mr. N. V. Everton** has been appointed sales manager of the lamp department of Metropolitan-Vickers Electrical Co., Ltd., with offices at Bush House (West Wing), Aldwych, London, W.C.2, the London headquarters of Metropolitan-Vickers Electrical Co., Ltd.

**Alderman F. B. Summerbee** has been appointed chairman of the Bournemouth Tramways Committee and Councillor E. J. Mapp, vice-chairman. Alderman W. H. Ridout, who has been chairman for eight years, recently intimated his desire not to be re-elected. Although relinquishing the chairmanship, he will remain a member of the Committee.

**Sir George Humphreys,** chief engineer of the London County Council, will be succeeded on December 1 by Mr. **T. Peirson Frank,** city engineer of Liverpool, and permanent way engineer of the Corporation Tramways. The General Purposes Committee of the London County Council has arranged that the services of Sir George shall be retained in connection with the tramways subway from Victoria-embankment to Southampton-row, and certain other special work in connection with housing and bridges.

## CONTRACTS.

**Plymouth Highways Committee** is inviting tenders for the supply of low loading motors for refuse collection.

**Durban Tramways Department** have accepted a tender of Messrs. T. Barlow for 100 sets of armature coils at £6 14s. 6d. each.

**Glasgow Transport Committee** has recommended the acceptance of the tender of Dorman Long & Co., Ltd., for the supply of fish plates.

**Cardiff Tramways Committee** has recommended the acceptance of the tender of John I. Thornycroft & Co., Ltd., for the supply of six omnibus chassis.

**Southend Tramways Committee** has recommended the acceptance of the tender of the Associated Equipment Co., Ltd., for the supply of seven single-deck omnibuses.

**Copenhagen Tramways Co.** has received from the Associated Equipment Co., a 110 h.p. "Renown" chassis on six wheels, with the frame extended to take a larger single-deck body. The machine is to be tested against several chassis of foreign manufacture. An A.E.C. engineer has accompanied the chassis to ensure that it is driven and maintained in a manner productive of the best results.

**Gledhill Brook Time Recorders, Ltd.,** of Huddersfield, following a previous order for 138 Gledhill-Brook time recorders, have received a repeat contract for 149 of the same machines for use in Admiralty dockyards. The firm has received an order from the Overseas Trade Department to supply all cash registers that will be required —between 50 and 60—at the British Empire Exhibition to be opened by the Prince of Wales in Buenos Aires next March.

## FINANCIAL ITEMS.

**Profit on Brighton Tramways.**—During the past financial year Brighton Corporation Tramways made a profit of over £14,000. The sum of £6,000, equivalent to a 1d. rate, has been contributed to the rates.

**L.C.C. Tramway Receipts.**—The traffic receipts for the week ended November 26 amounted to £82,649, a decrease of £1,957 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to November 26 (34 2-7 weeks) the total receipts were £2,838,051, a decrease of £32,440.

**The Anglo-Persian Oil Co.** has declared an interim dividend of 5 per cent. for the year 1930 on its £13,425,000 of issued ordinary share capital. A year ago the dividend was the same. For the preceding year the interim dividend was followed by a final payment of 15 per cent. The final payment for 1930 is not due to be declared until the accounts are available next year. The Government owns £7,500,000 of the ordinary capital.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended November 8 gave total receipts of £417,565, or £37 more than in the corresponding week of last year. The aggregate receipts for thirty-two weeks amounted to £13,533,738, showing an increase, with certain adjustments, of £114,155 over the corresponding period of last year.

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**Dennis Bros., Ltd.,** the Guildford motor manufacturers, announce a profit for the year ended September 30 of £286,805, or £49,781 less than last year. Owing to the policy of returning capital held in excess of requirements, the issued capital has been reduced since 1926 from £500,825 to £75,124, a tiny sum compared with the assets, which with the reserve and carry forward amount to £745,000. A dividend of 283½ per cent. is being paid, against 350 per cent. last year.

**Exeter Corporation Tramways** for the year ended March 31 last had total income of £45,227, being 18.73d. per car mile, and working expenses of £31,145, or 12.9d. per car mile. The gross profit of £14,082 was appropriated £5,948 to loan charges, £411 income tax, and £7,867 to renewals and reserve. Omnibus receipts totalled £9,725, an average of 11.07d. per omnibus mile, and working expenses were £8,065, or 9.18d. per omnibus mile. The gross profit of £1,660 was insufficient to pay loan charges £2,373 and income tax £123, so £836 was transferred from renewals and reserve.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. | Nov. 25 | 588 | 576 | — 12 | 34 | 20,096 | — 138 |
| „ Motor Buses | „ 25 | 289 | 328 | + 39 | 34 | 10,340 | + 1,883 |
| „ Total | „ 25 | 877 | 904 | + 27 | 34 | 30,436 | + 1,745 |
| Aberdeen Corp. | „ 19 | 4,201 | 4,385 | + 184 | 24½ | 131,349 | + 2,640 |
| Ashton-u-Lyne Corp. | „ 22 | 903 | 787 | — 116 | 34 | 28,768 | — 2,485 |
| „ Motor Buses | „ 22 | 473 | 486 | + 13 | 34 | 16,802 | + 188 |
| „ Trolley Buses | „ 22 | 287 | 255 | — 32 | 34 | 8,819 | — 736 |
| „ Total | „ 22 | 1,663 | 1,528 | — 135 | 34 | 54,389 | — 3,033 |
| Ayr Corporation | „ 22 | 423 | 396 | — 27 | 27 | 16,957 | — 1,348 |
| Barrow Corporation | „ 15 | 535 | 513 | — 22 | 33 | 19,117 | — 1,135 |
| „ Motor Buses | „ 15 | 395 | 373 | — 22 | 33 | 13,703 | + 621 |
| „ Total | „ 15 | 930 | 886 | — 44 | 33 | 32,820 | — 514 |
| Belfast City | „ 21 | 11,000 | 11,457 | + 457 | 33½ | 386,802 | + 11,869 |
| „ Motor Buses | „ 21 | 1,236 | 1,360 | + 124 | 33½ | 44,162 | + 8,581 |
| „ Total | „ 21 | 12,236 | 12,817 | + 581 | 33½ | 430,964 | + 20,450 |
| Birkenhead Corp. | „ 23 | 1,496 | 1,354 | — 142 | 34 | 51,417 | — 5,948 |
| „ Motor Buses | „ 23 | 3,064 | 3,684 | + 620 | 34 | 128,635 | + 3,869 |
| „ Total | „ 23 | 4,560 | 5,038 | + 478 | 34 | 180,052 | — 2,079 |
| Birmingham Corp. | „ 18 | 26,957 | 25,405 | — 1,552 | 33 | 862,851 | — 46,226 |
| „ Motor Buses | „ 18 | 13,532 | 16,474 | + 2,942 | 33 | 517,251 | + 78,714 |
| „ Trolley Buses | „ 18 | 575 | 524 | — 51 | 33 | 17,767 | — 769 |
| „ Total | „ 18 | 41,034 | 42,403 | + 1,339 | 33 | 1,397,869 | + 31,719 |
| Blackburn Corp. | „ 19 | 1,758 | 1,601 | — 157 | 33½ | 60,312 | — 5,549 |
| „ Motor Buses | „ 19 | 344 | 332 | — 12 | 33½ | 10,752 | + 9,745 |
| „ Total | „ 19 | 2,102 | 1,933 | — 169 | 33½ | 71,064 | + 4,196 |
| Bradford Corporation | „ 22 | 9,864 | 8,776 | — 1,088 | ... | ... | ... |
| „ Motor Buses | „ 22 | 3,239 | 2,987 | — 252 | ... | ... | ... |
| „ Trolley Buses | „ 22 | 1,031 | 1,876 | + 845 | ... | ... | ... |
| „ Miscellaneous | „ 22 | 364 | 530 | + 166 | ... | ... | ... |
| „ Total | „ 22 | 14,498 | 14,164 | — 329 | 34 | 485,963 | — 19,198 |
| Brighton Corporation | „ 23 | 2,153 | 2,081 | — 72 | 33½ | 94,639 | + 1,602 |
| Burnley Corporation | „ 22 | 2,933 | 2,611 | — 322 | — | ... | — |
| „ Motor Buses | „ 22 | 640 | 718 | + 78 | — | — | — |
| „ Total | „ 22 | 3,573 | 3,329 | — 244 | ... | ... | — |
| Bury Corporation | „ 23 | 1,905 | 1,520 | — 385 | 33½ | 59,296 | — 9,275 |
| „ Motor Buses | „ 23 | 796 | 1,415 | + 619 | 33½ | 41,176 | + 23,241 |
| „ Total | „ 23 | 2,701 | 2,935 | + 234 | 33½ | 100,472 | + 13,966 |
| Cardiff Corporation | „ 22 | 7,392 | 7,485 | + 93 | 33½ | 263,306 | + 2,047 |
| Chester Corporation | „ 23 | 408 | Nil | — 408 | 34 | Nil | — 14,913 |
| „ Motor Buses | „ 23 | Nil | 667 | + 667 | 34 | 22,754 | + 22,754 |
| „ Total | „ 23 | 408 | 667 | + 259 | 34 | 22,754 | + 7,841 |
| Chesterfield Corp. | „ 24 | 1,974 | 1,893 | — 81 | 34 | 65,914 | + 791 |
| Colchester Corp. | „ 26 | 522 | 586 | + 64 | 35 | 21,254 | + 2,045 |
| Colne Corporation | „ 26 | 648 | 628 | — 20 | 34 | 24,005 | — 448 |
| Coventry Corporation | „ 23 | 2,178 | 1,926 | — 252 | 34 | 65,914 | — 6,523 |
| „ Motor Buses | „ 23 | 1,782 | 1,874 | + 92 | 34 | 60,920 | + 6,193 |
| „ Total | „ 23 | 3,960 | 3,800 | — 160 | 34 | 126,834 | — 330 |
| Darlington Corp | „ 22 | 993 | 1,053 | + 60 | 33½ | 35,821 | + 2,579 |
| Derby Corporation | „ 22 | 2,422 | 2,154 | — 268 | 34 | 82,500 | — 3,126 |
| „ Motor Buses | „ 22 | 809 | 1,173 | + 364 | 34 | 31,496 | + 6,290 |
| „ Total | „ 22 | 3,231 | 3,327 | + 96 | 34 | 113,996 | + 3,164 |
| Dover Corporation | „ 22 | 345 | 368 | + 23 | 34 | 14,836 | + 484 |
| Dundee Corporation | „ 11 | 2,598 | 2,505 | — 93 | 25½ | 65,847 | — 2,243 |
| „ Motor Buses | „ 11 | 844 | 1,164 | + 320 | 25½ | 29,428 | + 7,664 |
| „ Total | „ 11 | 3,442 | 3,669 | + 227 | 25½ | 95,275 | + 5,421 |
| East Ham Corp. | „ 22 | 2,262 | 2,191 | — 71 | 33½ | 77,049 | — 83 |
| Edinburgh Corp. | „ 15 | 13,730 | 14,440 | + 710 | 26½ | 334,040 | + 6,842 |
| „ Motor Buses | „ 15 | 3,301 | 3,762 | + 461 | 26½ | 100,194 | + 7,865 |
| „ Total | „ 15 | 17,031 | 18,202 | + 1,171 | 26½ | 434,234 | + 14,707 |
| Exeter Corporation | „ 26 | 813 | 694 | — 119 | 35 | 27,688 | — 2,635 |
| „ Motor Buses | „ 26 | 215 | 401 | + 186 | 35 | 11,987 | + 6,517 |
| „ Total | „ 26 | 1,028 | 1,095 | + 67 | 35 | 39,675 | + 3,842 |
| Glasgow Corporation | „ 15 | 44,972 | 44,106 | — 866 | 24 | 1,042,663 | — 12,220 |
| „ Motor Buses | „ 15 | 6,634 | 10,704 | + 4,070 | 24 | 215,470 | + 80,234 |
| „ Total | „ 15 | 51,606 | 54,810 | + 3,204 | 24 | 1,258,133 | + 68,014 |
| Gloucester Corp. | „ 19 | 621 | 701 | + 80 | 33½ | 24,046 | + 4,505 |
| Grimsby Corporation | „ 22 | 1,417 | 1,566 | + 149 | 34 | 54,479 | + 5,413 |
| Halifax Corporation | „ 18 | 4,765 | 4,943 | + 178 | 32½ | 171,674 | + 17,542 |
| Huddersfield Corp. | „ 22 | 6,313 | 6,058 | — 255 | 34 | 216,838 | — 2,285 |
| Hull Corporation | „ 22 | 6,028 | 5,795 | — 233 | 34 | 195,348 | — 8,851 |
| „ Motor Buses | „ 22 | 1,435 | 1,804 | + 369 | 34 | 55,635 | + 8,808 |
| „ Total | „ 22 | 7,463 | 7,599 | + 136 | 34 | 250,983 | — 43 |
| Ilford Corporation | „ 22 | 1,480 | 1,538 | + 58 | 33½ | 51,306 | + 769 |
| Ipswich Corp. Trol.Bus | „ 22 | 1,241 | 1,298 | + 57 | 33½ | 46,141 | + 2,403 |
| Isle of Thanet | „ 19 | 343 | 366 | + 23 | 46½ | 38,925 | — 4,550 |
| Kilmarnock Corp. | „ 22 | 482 | 499 | + 17 | 27½ | 13,593 | + 571 |
| Lancashire Un. | „ 16 | 2,215 | 2,130 | — 85 | 45½ | 97,650 | — 5,656 |
| „ Motor Buses | „ 16 | 4,234 | 4,561 | + 327 | 45½ | 228,147 | + 27,994 |
| Leeds Corporation | „ 22 | 19,245 | 19,439 | + 194 | 33½ | 674,627 | + 10,588 |
| Leicester Corp. | „ 22 | 8,562 | 8,622 | + 60 | 34 | 284,680 | — 291 |
| Lincoln Corp. | „ 16 | 830 | 830 | Nil | 33 | 31,000 | + 202 |
| Liverpool Corp. | „ 22 | 23,540 | 25,832 | — 708 | 33½ | 905,500 | — 15,912 |
| „ Motor Buses | „ 22 | 3,006 | 3,338 | + 332 | 33½ | 111,753 | + 15,100 |
| „ Total | „ 22 | 29,546 | 29,170 | — 376 | 33½ | 1,017,253 | — 812 |
| London County Coun. | „ 26 | 84,606 | 82,649 | — 1,957 | 34½ | 2,838,051 | — 32,440 |
| Luton Corporation | „ 19 | 373 | 368 | — 5 | 33½ | 14,120 | + 254 |
| Maidstone Corp. | „ 20 | 128 | Nil | — 128 | 33½ | Nil | — 6,985 |
| „ Motor Buses | „ 20 | 318 | 253 | — 65 | 33½ | 9,326 | — 1,165 |
| „ Trolley Buses | „ 20 | 272 | 534 | + 262 | 33½ | 20,547 | + 10,206 |
| „ Total | „ 20 | 718 | 787 | + 69 | 33½ | 29,873 | + 2,056 |
| Manchester Corp. | „ 22 | 34,968 | 31,499 | — 3,469 | 34 | 1,086,714 | — 100,971 |
| „ Motor Buses | „ 22 | 4,790 | 9,414 | + 4,624 | 34 | 297,637 | + 129,340 |
| „ Total | „ 22 | 39,758 | 40,913 | + 1,155 | 34 | 1,384,321 | + 28,369 |
| Middlesbrough Corp. | „ 25 | 1,127 | 926 | — 201 | 34½ | 34,925 | — 4,078 |
| „ Motor Buses | „ 25 | 550 | 553 | + 3 | 34½ | 19,346 | + 1,192 |
| „ Total | „ 25 | 1,677 | 1,479 | — 198 | 34½ | 54,271 | — 2,886 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks. | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Tv.Corp. | Nov. 22 | 9,169 | 8,158 | — 1,011 | 33½ | 290,723 | — 49,085 |
| „ Motor Buses | „ 22 | 1,801 | 3,430 | + 1,629 | 33½ | 110,148 | + 41,287 |
| „ Total | „ 22 | 10,970 | 11,588 | + 618 | 33½ | 400,871 | — 7,798 |
| Newport Corporation | „ 15 | 1,700 | 1,068 | — 632 | 33 | 46,483 | — 8,566 |
| „ Motor Buses | „ 15 | 751 | 1,259 | + 508 | 33 | 33,211 | + 8,225 |
| „ Total | „ 15 | 2,451 | 2,327 | — 124 | 33 | 79,694 | — 341 |
| Northampton Corp. | „ 21 | 1,079 | 723 | — 356 | 33½ | 32,944 | — 4,568 |
| „ Motor Buses | „ 21 | 641 | 1,051 | + 410 | 33½ | 28,667 | + 5,999 |
| „ Total | „ 21 | 1,720 | 1,774 | + 54 | 33½ | 61,611 | + 1,431 |
| Nottingham Corp. | „ 20 | 6,270 | 5,481 | — 789 | 33½ | 193,370 | — 28,865 |
| „ Motor Buses | „ 20 | 2,749 | 3,582 | + 833 | 33½ | 114,725 | + 34,108 |
| „ Trolley Buses | „ 20 | 604 | 1,194 | + 590 | 33½ | 40,356 | + 20,323 |
| „ Total | „ 20 | 9,623 | 10,257 | + 634 | 33½ | 348,451 | + 25,566 |
| Oldham Corporation | „ 22 | 3,608 | 3,355 | — 253 | 35 | 117,087 | — 7,756 |
| „ Motor Buses | „ 22 | 1,916 | 1,855 | — 61 | 35 | 68,841 | — 1,428 |
| „ Total | „ 22 | 5,524 | 5,210 | — 314 | 35 | 185,928 | — 9,184 |
| Plymouth Corp. | „ 22 | 3,447 | 3,034 | — 413 | 33½ | 122,807 | — 6,428 |
| „ Motor Buses | „ 22 | 2,085 | 2,679 | + 594 | 33½ | 85,436 | + 18,572 |
| „ Total | „ 22 | 5,532 | 5,713 | + 181 | 33½ | 208,243 | + 12,144 |
| Portsmouth Corp. | „ 22 | 3,558 | 3,262 | — 296 | 34 | 144,996 | — 13,572 |
| „ Motor Buses | „ 22 | 1,673 | 2,804 | + 1,131 | 34 | 114,386 | + 44,022 |
| „ Total | „ 22 | 5,231 | 6,065 | + 835 | 34 | 259,382 | + 30,450 |
| Preston Corporation | „ 19 | 1,620 | 1,564 | — 56 | 33½ | 55,804 | — 2,406 |
| „ Motor Buses | „ 19 | 492 | 499 | + 7 | 33½ | 17,356 | + 734 |
| „ Total | „ 19 | 2,112 | 2,063 | — 49 | 33½ | 73,160 | — 1,672 |
| Rawtenstall Corp. | „ 23 | 857 | 649 | — 208 | 33½ | 21,948 | — 6,762 |
| „ Motor Buses | „ 23 | 511 | 674 | + 163 | 33½ | 23,631 | + 5,906 |
| „ Total | „ 23 | 1,368 | 1,323 | — 45 | 33½ | 45,579 | — 856 |
| Reading Corporation | „ 20 | 1,489 | 1,405 | — 84 | 34 | 48,603 | — 2,572 |
| „ Motor Buses | „ 20 | 895 | 1,031 | + 136 | 34 | 34,275 | + 3,382 |
| „ Total | „ 20 | 2,384 | 2,436 | + 52 | 34 | 82,878 | + 810 |
| Rochdale Corp. | „ 22 | 2,756 | 2,203 | — 553 | — | 99,827 | — 8,059 |
| „ Motor Buses | „ 22 | 1,546 | 2,162 | + 616 | — | 55,917 | + 2,396 |
| „ Total | „ 22 | 4,302 | 4,365 | + 63 | — | 146,744 | — 5,663 |
| Rotherham Corp. | „ 24 | 2,705 | 2,789 | + 84 | 34 | 94,949 | + 2,444 |
| Salford Corporation | „ 23 | 11,662 | 11,232 | — 420 | 33½ | 377,679 | — 2,613 |
| Sheffield Corp. | „ 22 | 20,837 | 19,991 | — 846 | 32½ | 989,912 | — 24,460 |
| Southampton Corp. | „ 19 | 3,176 | 3,216 | + 40 | 34 | 117,693 | + 2,262 |
| „ Motor Buses | „ 19 | 799 | 838 | + 39 | 34 | 29,517 | + 2,834 |
| „ Total | „ 19 | 3,975 | 4,054 | + 79 | 34 | 147,210 | + 5,096 |
| Southend-on-Sea Corp. | „ 19 | 1,681 | 1,679 | — 2 | 33½ | 75,288 | — 3,641 |
| „ Trolley Buses | „ 19 | 179 | 232 | + 53 | 33½ | 10,782 | + 3,271 |
| „ Total | „ 19 | 1,860 | 1,911 | + 51 | 33½ | 86,070 | — 370 |
| Southport Corp. | „ 22 | 1,159 | 1,148 | — 11 | 33½ | 46,194 | — 660 |
| „ Motor Buses | „ 22 | 307 | 333 | + 26 | 33½ | 14,721 | + 1,308 |
| „ Total | „ 22 | 1,466 | 1,481 | + 15 | 33½ | 60,915 | + 648 |
| St. Helens Corp. | „ 18 | 1,876 | 1,988 | + 112 | 33½ | 68,257 | + 3,379 |
| Sunderland Corp. | „ 25 | 2,260 | 2,126 | — 134 | 34 | 82,729 | — 1,324 |
| „ Motor Buses | „ 25 | 273 | 723 | + 450 | 34 | 21,223 | + 13,402 |
| „ Total | „ 25 | 2,533 | 2,849 | + 316 | 34 | 103,952 | + 12,078 |
| Swindon Corp. | „ 19 | 795 | 928 | + 133 | 33½ | 33,047 | + 6,144 |
| Wallasey Corp. | „ 22 | 1,156 | 1,097 | — 59 | 33½ | 42,149 | — 3,415 |
| „ Motor Buses | „ 22 | 1,790 | 1,897 | + 107 | 33½ | 79,969 | + 7,402 |
| „ Total | „ 22 | 2,946 | 2,994 | + 48 | 33½ | 122,118 | + 3,987 |
| Walsall Corporation | „ 16 | 3,413 | 3,694 | + 281 | 33 | 116,498 | + 3,555 |
| Walthamstow Corp. | „ 22 | 2,262 | 2,256 | — 6 | 33½ | 83,551 | — 429 |
| Warrington Corp. | „ 20 | 899 | 892 | — 7 | 34 | 30,275 | + 201 |
| „ Motor Buses | „ 20 | 464 | 511 | + 47 | 34 | 17,168 | + 1,877 |
| „ Total | „ 20 | 1,363 | 1,403 | + 40 | 34 | 47,443 | + 2,078 |
| West Ham Corp. | „ 20 | 5,895 | 5,862 | — 33 | 33½ | 201,776 | — 1,788 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses | „ 16 | 2,670 | 2,159 | — 511 | 33 | 80,411 | — 12,185 |
| „ Trolley Buses | „ 16 | 3,305 | 3,557 | + 252 | 33 | 115,343 | + 4,880 |
| „ Total | „ 16 | 5,975 | 5,716 | — 259 | 33 | 195,754 | — 7,305 |
| York Corporation | „ 19 | 1,024 | 904 | — 120 | 34 | 34,988 | — 893 |
| „ Motor Buses | „ 19 | 445 | 542 | + 97 | 34 | 17,594 | + 4,068 |
| „ Trolley Buses | „ 19 | 55 | Nil | — 55 | 34 | Nil | — 1,884 |
| Total | „ 19 | 1,524 | 1,446 | — 78 | 34 | 52,582 | + 1,291 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or *M* | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Nov. 25 | £89,203 | £79,884 | 47 *w* | £3,842,783 | — £219,149 |
| Brazilian Traction $ | Oct. | 4,289,258 | 3,714,677 | 10 *m* | 39,781,024 | —1,440,030 |
| British Columbia $ | Sept. | 1,169,278 | 1,206,579 | 3 *m* | 3,597,208 | + 102,457 |
| Buenos Aires Lacroze | Nov. 23 | 12,233 | 11,786 | 21 *w* | 233,745 | — 13,252 |
| Burma E. Sup. Co. Rs. | Oct. | 62,905 | 64,928 | 3 *m* | 197,198 | + 19,376 |
| Calcutta ... Rs. | Nov. 22 | 133,487 | 104,834 | 46½ *w* | 5,114,192 | — 792,264 |
| Cape Town ... ... | Oct. | 27,501 | 25,312 | ... | ... | — |
| Carthagena & Herrerias | Oct. | 1,953 | 559 | 10 *m* | 7,851 | — 2,852 |
| Durban Corporation | Sept. | 22,371 | 21,156 | 2 *m* | 46,227 | — 1,763 |
| East India ... ... | Oct. | 4,078 | 3,809 | 3 *m* | 11,488 | — 868 |
| Kalgoorlie ... ... | Aug. | 2,100 | 2,110 | 8 *m* | 13,772 | + 147 |
| Madras (2 weeks) Rs. | Nov. 15 | 43,821 | 45,521 | 44 *w* | 973,135 | + 50,578 |
| Para ... ... | Oct. | 17,887 | 12,110 | 11 *m* | 155,610 | — 10,803 |
| Port Elizabeth ... | Oct. | 7,593 | 6,904 | ... | ... | — |
| Rangoon ... Rs. | Oct. | 132,742 | 158,285 | 10 *m* | 1,503,315 | + 292,732 |
| Shanghai ... $ | Oct. | 371,611 | 445,900 | 10 *m* | 3,543,658 | + 175,998 |
| Singapore ... ...$ | Oct. | 133,000 | 142,000 | 1 *m* | 142,000 | + 9,000 |
| Winnipeg ...$ | Sept. | 518,521 | 484,609 | 9 *m* | 4,656,233 | — 194,943 |

## RAILWAY RECEIPTS.

| 47th Week ended Nov. 23rd | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 176,000 | — 9,000 | 327,000 | — 21,000 | 503,000 | — 30,000 | -1,311,000 |
| L.M.S.R. | 405,000 | — 29,000 | 817,000 | — 88,000 | 1,223,000 | — 117,000 | -4,524,000 |
| L.N.E.R. | 279,000 | — 17,000 | 679,000 | — 65,000 | 958,000 | — 82,000 | -2,975,000 |
| S.R. | 246,000 | — 8,000 | 112,000 | — 4,000 | 358,000 | — 12,000 | — 553,000 |
| Totals | 1,107,000 | — 63,000 | 1,935,000 | — 178,000 | 3,042,000 | — 241,000 | -9,363,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or − | Aggregate. 1930. | + or − |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Nov.22 | 286,200 | 294,800 | + 8,600 | 14,180,800 | + 735,700 |
| Lond. & Snb. Group | „ 22 | 42,100 | 43,200 | + 1,100 | 2,087,700 | + 113,900 |
| Metropolitan Railway | „ 22 | 36,600 | 35,600 | — 1,000 | 1,713,300 | + 8,800 |
| Liverpool Overhead | „ 23 | 1,566 | 1,374 | — 192 | 72,836 | — 6,558 |
| Mersey Railway ... | „ 22 | 4,419 | 4,290 | — 129 | 212,440 | + 3,280 |

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LONDON, DECEMBER 6, 1930.

## LONDON PASSENGER TRANSPORT BILL.

This week notice has been given of a Bill to be introduced shortly to establish a Transport Board for the London Traffic Area. A summary appears in another page. It is a stage in the preliminaries for substituting a single form of ownership for the public passenger transport undertakings, numbering nearly a hundred, in the wide territory embraced by the London Traffic Act, 1924. It will be remembered that in the autumn of 1929 the Labour Government refused further facilities to the L.C.C. and the Underground Railways co-ordination plan, and on December 2 following the Minister of Transport stated that a Bill would be introduced to replace municipal and private ownerships by a "single and simple form of public ownership." On the same date Mr. Morrison announced the appointment of Sir William McLintock, chartered accountant, to advise on the financial aspects of the scheme. Sir William's report was presented to the Minister on September 15, but no official statement as to its contents has been issued. Although the notice issued this week affords much interesting information it is silent upon one or two points upon which public interest is mainly centred. One is the constitution of the Transport Board. There are several models that might serve the purpose in view, notably the Central Electricity Board, the Port of London Authority, and the Metropolitan Water Board. The second- and third-named are based on mergers of numerous dock companies and water companies. The Board is to have the power of acquiring the various undertakings and to issue stock. This means that the large number of small omnibus firms now operating will disappear on terms. The undertakings that will remain are to be co-ordinated and developed as may be thought desirable by the Board. Though the main line railways are not included in the scheme, provision is to be made for co-ordinated working. It is proposed to take powers to operate both within and without the London Traffic Area, and to establish a monopoly by prohibiting or restricting the running of any public service vehicle if on any one journey any passenger is both taken up and set down within the London Traffic area. Nothing is indicated as to the management of the united undertakings, but provision is made for payment of remuneration to members. Silence is preserved, too, as to the manner in which the Minister will carry out his declaration that the Government intends to "provide for the principle of commercial management of a self-supporting consolidated system, ensuring the advantages of vigorous business enterprise." This is a complete breakaway from Socialist principles, but on no other condition is the measure likely to receive the support of the private undertakings concerned or of those municipal owners who have a right conception of their duty to their constituents.

## THE NEW TRAFFIC COMMISSIONERS.

### THREE CHAIRMEN APPOINTED.

Mr. William Chamberlain, general manager and engineer of the Belfast Corporation Tramways, has been appointed by the Minister of Transport chairman of the Traffic Commissioners of the North-Western Area. This area includes several of the Welsh counties, Cheshire, and parts of Derbyshire and Lancashire, and the headquarters will be at Manchester.

Mr. Chamberlain, who is fifty-two years of age, went to Belfast on October 2, 1928, when the transport undertaking was suffering heavy losses. He converted it into a profit-making concern, the net surplus for the last financial year being £92,880. Before going to Belfast he was for three and a half years general manager of the Leeds tramways. A great part of his career was spent at Oldham, where for twelve years he was mains superintendent and commercial engineer in the electricity department, after which he was joint borough electrical engineer and manager for four years. Early in 1918 he was appointed general manager and engineer of the tramways, and just before leaving he was organising a trolleybus system between Oldham and Ashton-under-Lyne.

Mr. Chamberlain's resignation from the Belfast Tramways was announced at a meeting of the Corporation on Monday. Councillor J. D. McClure, chairman of the Tramways Committee, paid a high tribute to Mr. Chamberlain's work in Belfast and congratulated him on his new appointment. He was induced to come to Belfast under promise by the Corporation that his pension would be safeguarded, but that arrangement was afterwards turned down and therein Belfast dishonoured itself. Mr. Chamberlain, however, played the game, and although offered a similar position at Manchester with the same salary and pension rights he came to Belfast, worked night and day, and wrought a marvellous change in the administration.

Several other members of the Corporation spoke in similar terms of Mr. Chamberlain's services to Belfast.

Last week we reported the appointment of Mr. Henry Riches, O.B.E., Chief Constable of Middlesbrough, to be chairman of the Commissioners of the Northern Area, the headquarters of which will be at Newcastle-upon-Tyne. Mr. Riches has held every rank in the police service, from constable to chief constable. He has been chief constable of Middlesbrough for 28 years. He is also chief inspector of public service vehicles, and in 1927 was instrumental in setting up the Tees-side Regional Committee for the control of public service vehicles operating in North Yorkshire and South Durham. This is in effect a miniature traffic area extending from Whitby to Durham. In 1929 Mr. Riches explained the scheme to the Royal Commission on Transport, and the merits of the organisation met with the wholehearted approval of the Commissioners. He has also acted as honorary secretary of various committees set up by the Home Office in connection with traffic control, including the committee which led to the standardisation of traffic signals now in use throughout Great Britain. He is now on loan from the Middlesbrough Watch Committee to the Ministry of Transport to assist in preparing the measures for bringing Part IV of the Road Traffic Act into operation.

Mr. J. H. Stirk, J.P., traffic manager of Birmingham Co-operative Society, and formerly in the L.M.S. Railway service, has been appointed chairman of the East Midlands Traffic Commissioners, with headquarters at Nottingham.

**Municipal Tramways Conference.**—In the Journal of the Municipal Tramways and Transport Association for November it is stated that for some time past it has been recognised that September is very late in the year to hold a conference. The Council has, therefore, decided to change the month from September to June. For 1931 the dates of the conference, which will be held at Southampton, will be Tuesday, Wednesday, Thursday and Friday, June 23 to 26. The annual meeting of the Managers' Section in 1931 will be held at Manchester on Thursday and Friday, September 10 and 11.

**Dublin Tramcars on Shannon Current.**—The Dublin United Tramway Co.'s tramway system is now being run entirely on current supplied from the Shannon electricity supply. It is understood that the company will pay the Electricity Board the same price as that at which the company were able to generate their own power, one halfpenny per unit. The company's generating station has been closed, and it may be converted into an omnibus depot.

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## LONDON PASSENGER TRANSPORT.

THE GOVERNMENT BILL.

Particulars have been advertised this week of the London Passenger Transport Bill, which is to be presented to Parliament by Mr. Herbert Morrison, the Minister of Transport, in the beginning of the New Year. The notice elaborates certain proposals of the Government as previously outlined by Mr. Morrison and published in our issue of October 4.

The Bill will provide for the creation of a Transport Board for the London Traffic Area. It is proposed to transfer to this Board the London County Council Tramways, all the undertakings of the London Underground Group, including the Metropolitan Tramways, the London United Tramways, the South Metropolitan Tramways, the Union Construction & Finance Co., the London General Omnibus Co. and its auxiliaries, and all the other omnibus companies in the London Traffic Area as defined in the London Traffic Act, 1924. A list of these companies is given in the notice. The Board will also acquire the transport undertakings owned or operated by the local authorities of Barking, Bexley, Croydon, the City of London, Dartford, East Ham, Erith, Ilford, Leyton, Walthamstow and West Ham, and by the County Councils of Hertfordshire and Middlesex. Under the Bill it is proposed that any local authority adjacent to the area may enter into agreement for the Board to operate its service within that area.

The Board would have the duty of managing, maintaining, carrying on, co-ordinating, improving and extending the existing undertakings, and would be empowered to operate public service vehicles, both within and without the London Traffic Area, to manufacture rolling stock, vehicles and appliances, and to dispose of any of the undertakings.

Provision is made for the payment of compensation to any body or individual in respect of loss caused by the prohibition or curtailment of existing services, also for compensation to be paid to employees who may suffer pecuniary loss owing to the transfer of undertakings.

The Board would be empowered to issue stock, and various financial provisions in connection with the transfer are enumerated.

The suburban traffic of the main line railways does not come within the scope of the proposals, but there is provision for co-ordinating the working of the undertakings of the Board with those of the railways, and for levying, fixing and pooling the fares and charges.

Power will be sought to fix, increase or reduce fares, and the Minister of Transport will be empowered to require the Board to provide new or improved transport facilities. Any question relating to fares and charges for passengers on the Metropolitan Railway will be excluded from the jurisdiction of the Railway Rates Tribunal.

The Board would have the right to prohibit or restrict the running within the London Traffic Area of any public service vehicle which on any one journey both takes up and sets down any one passenger within the area. The Board would be exempt from the provisions of Part II of the Road Traffic Act and that section of Part IV relating to road service licences.

It is also proposed to transfer to the Board the right to run steamboats on the River Thames which was obtained by the London County Council in 1904.

## LEYTON TRAMCAR CONTRACTS.

Leyton Borough Council has accepted tenders for the 50 new tramcars and equipment required under the renewed agreement for inter-running powers with the London County Council. The tenders were certified to be in order by the general manager of the L.C.C. Tramways. The accepted tenders were as follow :—

Fifty electric double-deck tramway bodies.—English Electric Co., Ltd., Preston, £89,375. Highest tender, £95,325.

Fifty sets of electrical equipments.—British Thomson-Houston Co., Ltd., London, £40,675. Highest tender, £43,725.

Fifty centre-bearing swing bolster tramcar trucks.—Electro-Mechanical Brake Co., Ltd., West Bromwich, £13,225. Highest tender, £16,033.

Fifty sets of magnetic track and wheel brake equipments.—Metropolitan-Vickers Electrical Co., Ltd., Manchester, £2,537. Highest tender, £4,650.

Car traverser.—Holt & Willetts, Cradley Heath, £425. Highest tender, £950.

The contract for fifty double-deck bodies is the latest of a number of important electric traction contracts that have been placed with the English Electric Co. in recent times. The bodies will be generally similar to the fifty recently completed for the London County Council by the same company, and whether considered from the engineering side or from the passengers' point of view, the design sets a new standard in tramcar construction. Structurally the bodies are of metal design, and, therefore, are not only safer and more durable, but give an appreciably greater useful width in the saloons. The seating is particularly luxurious, the backs and seats being upholstered. The floors are covered with special linoleum. The scheme of decoration is simple and bright. Much attention has been given to providing thorough but draughtless ventilation, and in addition to special ventilators the upper saloon is fitted with half-drop windows. Ample illumination is provided on both decks.

**Walthamstow to Buy New Cars.**—Walthamstow Council has decided to purchase additional new tramcars at a cost of £19,556.

## THE ROAD TRAFFIC ACT.

Part I of the Road Traffic Act came into force on December 1, with the exception of Sections 10, 17, 19, and 25. Section 10, which provides for the abolition of the speed limit in the case of ordinary motor cars and motor cycles, is to come into force on January 1. Section 17, which deals with the requirements as to employment of drivers and attendants on motor vehicles and trailers, will become effective on the same date.

Part II, which deals with the provision to be made against third-party risks arising out of the use of motor vehicles, will come into force on January 1.

Part III, which amends the law relating to highways, and deals with the offences of neglecting to comply with traffic directions and of leaving vehicles in dangerous positions, became effective on December 1.

Part IV, which deals with the licensing and regulation of public service vehicles (motor omnibuses and motor coaches), came into force on December 1, so far as is necessary to enable the Traffic Commissioners and their staffs to be appointed. Further provisions of this part of the Act are to come into force on January 1 for the purpose of enabling the Commissioners to receive applications for licences, consents, etc., and to consider them and reach decisions, but the final date on which this Part will become fully operative, *i.e.*, when services of public service vehicles can be operated only under the Traffic Commissioners' licences, has not yet been finally determined. The provisional date which the Minister has in mind for this purpose is April 1 next.

Part V, which confers additional powers on local authorities with respect to the running of public service vehicles, is to come into force on January 1 for the purpose of enabling these authorities to apply to the Traffic Commissioners for their consent to run public service vehicles on new routes outside their areas and for enabling them to make the working agreements with other operators, whether municipal or private, which are authorised by Section 105. It is intended that this part shall become fully operative at the same date as Part IV.

The Minister has already announced his intention of deferring the operation of Section 19 of the Act, which deals with the limitation of time for which drivers of certain vehicles may remain continuously on duty, until February 1, but no order with regard to the commencement of this Section has yet been made. The Minister proposes shortly to confer with representatives of the railway and canal companies and highway authorities with regard to the provisions of Section 25, which deals with the restriction of the use of weak bridges by heavy vehicles, but the date on which this Section, which will involve the replacement of a very large number of notices on bridges, will become operative has not yet been fixed.

## DAIMLER DEMONSTRATION AT NEWCASTLE.

The Daimler Co. on Tuesday gave a very successful demonstration at Newcastle with three omnibuses—two double-deck and one single-deck—equipped with their fluid flywheel system. A stripped chassis was shown at the Byker depot of the Corporation, and Mr. F. G. Couch, of the Daimler Co., clearly explained the operation of the fluid flywheel and pointed out its advantages. Briefly the system is a device which employs the use of a fluid as a transmitter of energy instead of the usual clutch or friction contact involved in the normal transmission system. The gear-box is of the epicyclic pattern, and the pedal corresponding to the usual clutch pedal operates the change of gear pre-selected by the movement of a lever at the top of the steering column, so that there is no need for the driver to take his hands from the steering wheel in traffic. The engine will turn over with any gear engaged when the bus is stationary, since the fluid flywheel only takes up the drive on a level road when the engine revolutions exceed 600 per minute. This system was described in the issue of THE TRAMWAY AND RAILWAY WORLD of November 13.

The visitors were afterwards given an opportunity to test the operation of the machines on the road. The vehicles moved off smoothly up the steep incline of Dean-street, where they were stopped without brakes, and were held by the transmission with the engine still running. They were then restarted easily. On a run to Morpeth the vehicles were subjected to various tests, which were satisfactorily met. At a luncheon given by the Daimler Co., Alderman Richard Mayne, chairman of the Newcastle Transport Committee, said that one of their difficulties was the question of the future of tramcar drivers when tramcars were replaced by omnibuses. Gear changing seemed to be a matter of "knack," which some tram drivers could not easily acquire. The new system would relieve the tramway authority of difficulty in transferring men from the cars to the buses, owing to the simpler operation. Among those present were the Lord Mayor of Newcastle (Alderman D. Adams), Alderman Mayne, Mr. T. P. Easton, general manager, Newcastle Corporation Transport, Alderman Jeffreys, chairman of the Sunderland Tramways Committee, Mr. C. A. Hopkins, general manager, Sunderland Tramways, and representatives of other neighbouring transport authorities.

**Longer Holidays for Nottingham Employees.**—Nottingham Corporation Transport Committee has decided on an extended holiday scale for the whole of the permanent workmen employed by the department, as follows: After one year's continuous satisfactory service, eight working days; two years, nine days; three years, ten days; four years, eleven days; five years, twelve days.

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## MISCELLANEOUS NEWS AND NOTES.

**Ipswich Transport Committee** is considering the extension of the trolleybus routes.

**Christmas Day Service at Sheffield.**—The Sheffield City Council on Wednesday decided by a large majority to run a skeleton service of tramcars and omnibuses on Christmas Day.

**Coach Station for Cheltenham.**—Black & White Motorways, Ltd., have received permission from the Cheltenham Watch Committee to erect a motor-coach station at St. Margarets.

**Change Over at Wigan.**—The Ashton-in-Makerfield route of Wigan Corporation Tramways was closed on December 1 and motor omnibuses substituted. Other routes will also be changed over.

**Higher Omnibus and Rail Fares.**—The L.N.E. Railway Company and the United Automobile Services and other omnibus owners have agreed to increase the rail and omnibus fares between Middlesbrough and Redcar by 25 per cent.

**Proposed Sunderland Tramway Extension.**—A joint meeting of Sunderland Tramways and Highways Committee is to discuss a proposal to extend the tramway service to the borough boundary at Seaburn. The cost is estimated at £8,000.

**Future of Bath Tramways.**—It is understood that negotiations are proceeding between the Traffic Sub-Committee of Bath Watch Committee and the Bath Electric Tramways, Ltd., regarding the substitution of motor omnibuses or trolleybuses for the tramways.

**London Tramway Link-up.**—The scheme for linking up the tramway system of the Walthamstow Corporation and that of the Metropolitan Electric Tramways between Ferry-lane and Tottenham High-road by the Hale and High Cross-road, has been approved.

**Elephant and Castle Scheme.**—A Select Committee of the House of Commons which has been considering the Bill for traffic improvement at the Elephant and Castle, south-east London, has found the preamble proved subject to an undertaking to be given to certain petitioners.

**Bolton Buys Omnibus Service.**—The Chairman of Bolton Tramways Committee has reported that terms have been arranged for the purchase by the Corporation from the Ribble Motor Services, Ltd., of the omnibus service recently operated by Freeman's Service between Bolton and Horwich.

**More Trolleybuses for Wolverhampton.**—Next Monday Wolverhampton Corporation will consider a recommendation by the Transport Committee to convert the Fallings Park route to the trolleybus system, and to purchase twelve trolleybuses. The estimated cost of the vehicles and equipment is £36,388.

**A Yorkshire Pooling Agreement.**—The four constituent authorities forming the Dearne District Light Railways Joint Committee have unanimously confirmed the steps taken to enter into an agreement with the Yorkshire Traction Co. for the co-ordination of services and the pooling of revenues from such services.

**Southport Omnibus Loan Sanctioned.**—The Ministry of Health has sanctioned the application of the Southport Corporation for permission to borrow £22,890 for the purchase of fourteen omnibuses. The order for the vehicles was placed recently with the Vulcan Motor and Engineering Co. (1906), Ltd., Southport. They will replace certain tramcar services.

**Omnibuses for Carlisle.**—Subject to settlement of certain details arrangements have been made for the Ribble Motorbus Company of Preston to take over the undertaking of the Carlisle and District Transport Co., Ltd. It is anticipated that the cars will be removed from the streets within a few weeks and will be replaced by the Ribble Company's omnibuses.

**Twopenny Minimum Fare for Bradford Omnibuses.**—Bradford Finance Estimates Committee has approved a recommendation of the Tramways Committee that twopence should be the minimum fare on all the Corporation omnibus services. It involves the abolition of many penny fare sections. The proposal has still to be considered by the City Council.

**Proposed Electrolysis Conference.**—A joint committee on Electrolysis of the Municipal Tramways and Transport Association and the Tramways, Light Railways and Transport Association has requested the Ministry of Transport to convene an early meeting with representatives of the Post Office in order further to consider the question of electrolysis in the light of recent developments. Colonel Trench has been requested to ask the Post Office not to press for a settlement of any claims until after the proposed meeting.

**Bournemouth Deputation at Wolverhampton.**—A deputation from Bournemouth, including the Mayor (Councillor Percy Bright), members of the Tramways Committee, and the general manager of the Tramways Department, Mr. I. Bulfin, visited Wolverhampton on November 28 and inspected the transport undertaking, giving particular attention to the trolleybus system. The deputation was received by the Mayor (Councillor J. Haddock), members of the Transport Committee, and Mr. C. Owen Silvers, general manager and engineer of the Transport Department.

**Glasgow Corporation to Make Bow Collector.**—Approval has been given by Glasgow Town Council of the Transport Committee's proposal to purchase the patent rights of the Fischer bow collector so that the Corporation may construct the apparatus at their Coplawhill works. Councillor P. J. Dollan, convener of the Committee, stated that the price was not disclosed because the department were getting special consideration. The patent rights applied only to the Corporation's own service. As we have already reported all the Glasgow cars will be equipped with the bow collector, at a cost of £20,000.

**Accrington Tramways.**—The Ministry of Transport has not yet sanctioned the abandonment of the whole of Accrington Corporation Tramways. The sanction at present relates only to one section of the undertaking, viz., Baxenden, which has a route mileage of approximately 2.5 miles. The abandonment of other sections is contemplated, but the Corporation have not yet applied to the Ministry of Transport for the sanction for the disuse of other routes.

## CONTRACTS.

**Crossley Motors, Ltd.,** have received an order from Stockport Corporation for six 38-110 h.p. six-cylinder chassis fitted with 32-seat saloon service type bodies of Crossley manufacture.

**The Daimler Co., Ltd.,** has an order from the London General Omnibus Co. for three chassis fitted with the fluid flywheel, a pre-selective, self-changing gear, and silent four-speed gearbox. The chassis will be fitted with 50-seat bodies, and the vehicles will be in service early in 1931.

**Manchester Transport Committee** has accepted the following tenders: Joseph Cockshot & Co., Ltd., Manchester, two goods and one passenger motor vehicles; Tudor Accumulator Co., Ltd., and Britannia Batteries, Ltd., electric vehicle batteries; Whitecross Co., Ltd., Warrington, cadmium copper trolley wire.

**A. E. C. Oil-Driven Lorries for the G.W.R.**—Two lorries fitted with the new high-speed oil engines of the Associated Equipment Co., Ltd., are being supplied to the Great Western Railway Co. The test of these vehicles is being looked forward to with great interest, in view of the low operating costs recorded by the A.E.C. The chassis, which are of 6-8-ton capacity, will be fitted with steel tipping bodies.

**The Great Western Railway Co.** is purchasing 67 motor lorries, vans and trucks and five tractors in replacement of existing vehicles. These vehicles will be in addition to the 130 that were decided upon last month. Orders for the latter have been placed as follows: 54 6-8-ton chassis, John I. Thornycroft & Co., Ltd.; 108 1½-2-ton chassis, Dennis Bros., Ltd., Guildford; 18 1¾-2-ton vans, Morris Garages, Oxford; 5 Ford trucks; one rigid six-wheel 10-12-ton chassis, John I. Thornycroft & Co., Ltd.; chassis on pneumatic tyres for the conveyance of cattle, Maudslay Motor Co., Ltd., Coventry.

**The Central Electricity Board** has placed the following contracts in connection with the North-East scheme of electrical development: A. Reyrolle & Co., switchgear, £53,000; 3,300 volt, 66,000 volt, and 132,000 volt overhead transmission lines, J. L. Eve Construction Co., British Insulated and Helsby Cable Co., British Electrical Transformer Co., and Ferranti, Ltd. The total of the orders is £440,000, bringing the value of contracts already placed for the North-East scheme to over £2,000,000. The first lines to be erected will be those from Sunderland to South Shields and from the North Tees power station to Darlington. These will be completed within the next year, and South Shields and Darlington Corporations will get their supplies from them.

## PERSONAL.

**Motorman J. E. Hardy,** of the Manchester Corporation Tramways, has retired after 39 years' service.

**Alderman A. Turney** has been re-elected chairman of Nottingham Corporation Transport Committee and Councillor J. Farr vice-chairman. This is Alderman Turney's third period as chairman.

**Alderman R. Wood** and **Alderman J. Westbrook** have been re-appointed chairman and vice-chairman respectively of the Stalybridge, Hyde, Mossley and Dukinfield Tramways and Electricity Board.

**Councillor Thorn,** chairman of Leyton Electric Lighting and Tramways Committee, **Alderman Daines,** deputy Mayor, **Alderman Russell** and **Councillor Reynolds** have been appointed to represent the Council on a joint committee with the London County Council to deal with matters affecting the Leyton Tramways.

**Increases of Salaries at Bexley.**—On the recommendation of the Electricity and Tramways Committee, Bexley Urban Council has voted increases of salary as appended: Mr. A. J. Abraham, general manager and electrical engineer, from £700 to £800, with two annual increments of £25 to £850; Mr. F. A. Buley, assistant electrical engineer, from £325 to £350, subject to his taking over the overhead work.

## HULL TRAMWAYS MANAGEMENT.

Hull City Council on Thursday decided by a vote of 43 to 31 to give six months' notice to terminate the engagements of Mr. E. S. Rayner, the general manager of the tramways, Mr. B. J. E. Bruce, rolling stock superintendent, and Mr. H. D. Ingram, assistant engineer. At the October meeting of the Council a resolution was passed calling upon the officials to resign, which they refused to do. Having received the refusal the Tramways Committee on November 24 decided to defer consideration of the matter for twelve months. The minute containing this decision was submitted to the Council on Thursday, and confirmation was formally moved by Councillor J. G. Hewett, chairman of the Tramways Committee. Councillor T. Hardaker said in his opinion the manager had never been given an opportunity to manage the tramways, and he thought he and the other officials should have a twelve months' trial under the new regime. Councillor Hewett urged the Council to give the new Tramways Committee a chance to retrieve the position. His scheme was for a six months' moratorium.

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## FINANCIAL ITEMS.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended November 15 gave total receipts of £412,141, or £5,341 more than in the corresponding week of last year. The aggregate receipts for thirty-three weeks amounted to £13,945,910, showing an increase, with certain adjustments, of £121,769 over the corresponding period of last year.

**L.C.C. Tramways Receipts.**—The traffic receipts for the week ended December 3 amounted to £82,450, a decrease of £3,403 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to December 3 (35 2-7 weeks) the total receipts were £2,920,508, a decrease of £36,690.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | Dec. 2 | 592 | 543 | — 49 | 35 | 20,639 | — 187 |
| „ Motor Buses ... | „ 2 | 295 | 305 | + 10 | 35 | 10,645 | + 1,893 |
| „ Total ... ... | „ 2 | 887 | 848 | — 39 | 35 | 31,284 | + 1,706 |
| Aberdeen Corp. ... | Nov. 26 | 4,252 | 4,487 | + 235 | 25¾ | 135,836 | + 2,875 |
| Ashton-u-Lyne Corp. | „ 29 | 915 | 797 | — 118 | 35 | 29,565 | — 2,602 |
| „ Motor Buses ... | „ 29 | 471 | 478 | + 7 | 35 | 17,279 | + 195 |
| „ Trolley Buses ... | „ 29 | 288 | 256 | — 32 | 35 | 9,075 | — 768 |
| „ Total ... ... | „ 29 | 1,674 | 1,531 | — 143 | 35 | 55,919 | — 3,175 |
| Ayr Corporation ... | „ 29 | 449 | 391 | — 58 | 28 | 17,348 | — 1,406 |
| Barrow Corporation... | „ 29 | 528 | 509 | — 19 | 35 | 20,170 | — 1,141 |
| „ Motor Buses ... | „ 29 | 371 | 358 | — 13 | 35 | 14,434 | + 606 |
| „ Total ... ... | „ 29 | 899 | 867 | — 32 | 35 | 34,604 | — 535 |
| Belfast City ... ... | „ 28 | 11,173 | 11,418 | + 245 | 34¾ | 398,220 | + 12,114 |
| „ Motor Buses ... | „ 28 | 1,236 | 1,385 | + 149 | 34¾ | 45,547 | + 8,730 |
| „ Total ... ... | „ 28 | 12,409 | 12,803 | + 394 | 34¾ | 443,767 | + 20,844 |
| Birkenhead Corp. ... | „ 30 | 1,492 | 1,378 | — 114 | 35 | 52,794 | — 6,062 |
| „ Motor Buses ... | „ 30 | 3,032 | 3,646 | + 614 | 35 | 132,281 | + 4,484 |
| „ Total ... ... | „ 30 | 4,524 | 5,024 | + 500 | 35 | 185,075 | — 1,578 |
| Birmingham Corp. ... | „ 25 | 27,613 | 25,718 | — 1,895 | 34 | 888,569 | — 48,121 |
| „ Motor Buses ... | „ 25 | 14,002 | 16,717 | + 2,715 | 34 | 533,969 | + 81,429 |
| „ Trolley Buses ... | „ 25 | 592 | 534 | — 58 | 34 | 18,301 | — 826 |
| „ Total ... ... | „ 25 | 42,207 | 42,969 | + 762 | 34 | 1,440,839 | + 32,482 |
| Blackburn Corp. ... | „ 26 | 1,837 | 1,702 | — 135 | 34¾ | 62,015 | — 5,676 |
| „ Motor Buses ... | „ 26 | 350 | 371 | + 21 | 34¼ | 11,122 | ... |
| „ Total ... ... | „ 26 | 2,187 | 2,073 | — 114 | 34¾ | 73,137 | ... |
| Bradford Corporation | „ 29 | 10,100 | 8,898 | — 1,202 | ... | ... | ... |
| „ Motor Buses ... | „ 29 | 3,301 | 3,047 | — 254 | ... | ... | ... |
| „ Trolley Buses ... | „ 29 | 1,012 | 1,914 | + 902 | ... | ... | ... |
| „ Miscellaneous ... | „ 29 | 296 | 390 | + 94 | ... | ... | ... |
| „ Total ... ... | „ 29 | 14,709 | 14,249 | — 460 | 34 | 500,212 | — 19,658 |
| Brighton Corporation | „ 30 | 2,190 | 2,135 | — 55 | 33¾ | 96,774 | + 1,547 |
| Burnley Corporation... | „ 29 | 3,020 | 2,594 | — 426 | ... | ... | ... |
| „ Motor Buses ... | „ 29 | 659 | 745 | + 86 | ... | ... | ... |
| „ Total ... ... | „ 29 | 3,679 | 3,339 | — 340 | ... | ... | ... |
| Bury Corporation ... | „ 30 | 1,887 | 1,491 | — 396 | 34¾ | 60,787 | — 9,670 |
| „ Motor Buses ... | „ 30 | 784 | 1,337 | + 553 | 34¾ | 42,513 | + 23,793 |
| „ Total ... ... | „ 30 | 2,671 | 2,828 | + 157 | 34¾ | 103,300 | + 14,123 |
| Cardiff Corporation ... | „ 29 | 7,792 | 7,547 | — 245 | 34¾ | 270,853 | + 1,804 |
| Chester Corporation ... | „ 23 | 408 | Nil | — 408 | 34 | Nil | — 14,913 |
| „ Motor Buses ... | „ 23 | Nil | 667 | + 667 | 34 | 22,754 | + 22,754 |
| „ Total ... ... | „ 23 | 408 | 667 | + 259 | 34 | 22,754 | + 7,841 |
| Chesterfield Corp. ... | Dec. 1 | 1,988 | 1,970 | — 18 | 35 | 67,884 | + 773 |
| Colchester Corp. ... | „ 3 | 567 | 562 | — 5 | 36 | 21,816 | + 2,043 |
| Colne Corporation ... | „ 3 | 656 | 638 | — 18 | 35 | 24,643 | — 466 |
| Coventry Corporation | Nov. 30 | 2,279 | 1,896 | — 383 | 35 | 67,810 | — 6,906 |
| „ Motor Buses ... | „ 30 | 1,846 | 1,806 | — 40 | 35 | 62,726 | + 6,152 |
| „ Total ... ... | „ 30 | 4,125 | 3,702 | — 423 | 35 | 130,536 | — 754 |
| Darlington Corp ... | „ 29 | 997 | 1,032 | + 35 | 34¾ | 36,854 | + 2,614 |
| Derby Corporation ... | „ 29 | 2,502 | 1,990 | — 512 | 35 | 84,490 | — 3,638 |
| „ Motor Buses ... | „ 29 | 819 | 1,084 | + 265 | 35 | 32,580 | + 6,555 |
| „ Total ... ... | „ 29 | 3,321 | 3,074 | — 247 | 35 | 117,070 | + 2,917 |
| Dover Corporation ... | „ 29 | 366 | 372 | + 6 | 35 | 15,258 | + 489 |
| Dundee Corporation... | „ 11 | 2,598 | 2,505 | — 93 | 25¾ | 65,847 | — 2,243 |
| „ Motor Buses ... | „ 11 | 844 | 1,164 | + 320 | 25¾ | 29,428 | + 7,664 |
| „ Total ... ... | „ 11 | 3,442 | 3,669 | + 227 | 25¾ | 95,275 | + 5,421 |
| East Ham Corp. ... | „ 29 | 2,399 | 2,195 | — 204 | 34¾ | 79,244 | — 231 |
| Edinburgh Corp. ... | „ 22 | 13,853 | 13,865 | + 12 | 27¾ | 407,905 | + 6,853 |
| „ Motor Buses ... | „ 22 | 3,416 | 3,594 | + 178 | 27¾ | 103,788 | + 8,043 |
| „ Total ... ... | „ 22 | 17,269 | 17,459 | + 190 | 27¾ | 511,693 | + 14,896 |
| Exeter Corporation ... | Dec. 3 | 808 | 668 | — 140 | 36 | 28,357 | — 2,815 |
| „ Motor Buses ... | „ 3 | 211 | 388 | + 176 | 36 | 12,375 | + 6,694 |
| „ Total .. ... | „ 3 | 1,019 | 1,056 | + 36 | 36 | 40,732 | + 3,879 |
| Glasgow Corporation... | Nov. 29 | 45,383 | 42,077 | — 3,306 | 26 | 1,126,734 | — 18,031 |
| „ Motor Buses ... | „ 29 | 6,781 | 10,307 | + 3,526 | 26 | 236,064 | + 87,518 |
| „ Total ... ... | „ 29 | 52,164 | 52,384 | + 220 | 26 | 1,362,798 | + 69,487 |
| Gloucester Corp. ... | „ 26 | 651 | 746 | + 95 | 34¾ | 24,792 | + 4,600 |
| Grimsby Corporation | „ 29 | 1,457 | 1,526 | + 69 | 35 | 56,005 | + 5,478 |
| Halifax Corporation | „ 25 | 5,003 | 5,005 | + 2 | 34½ | 176,679 | + 17,544 |
| Huddersfield Corp. ... | „ 29 | 6,344 | 6,164 | — 180 | 35 | 223,002 | — 2,466 |
| Hull Corporation ... | „ 29 | 6,227 | 5,770 | — 457 | 35 | 201,118 | — 9,309 |
| „ Motor Buses ... | „ 29 | 1,473 | 1,831 | + 358 | 35 | 57,467 | + 9,167 |
| „ Total ... ... | „ 29 | 7,700 | 7,601 | — 99 | 35 | 258,585 | — 142 |
| Ilford Corporation ... | „ 29 | 1,584 | 1,555 | — 29 | 34½ | 52,862 | + 776 |
| Ipswich Corp. Trol.Bus | „ 29 | 1,298 | 1,332 | + 34 | 34½ | 47,486 | + 2,456 |
| Isle of Thanet ... | „ 26 | 387 | 357 | — 30 | 47¼ | 39,282 | — 4,580 |
| Kilmarnock Corp. ... | „ 29 | 489 | 497 | + 8 | 28¾ | 14,091 | + 579 |
| Lancashire Un. ... | „ 23 | 2,276 | 2,167 | — 109 | 46¾ | 93,840 | — 5,683 |
| „ Motor Buses ... | „ 23 | 4,363 | 4,629 | + 266 | 46¾ | 232,725 | + 28,238 |
| Leeds Corporation ... | „ 29 | 19,793 | 19,562 | + 231 | 34½ | 694,189 | + 10,669 |
| Leicester Corp. ... | „ 29 | 8,750 | 8,233 | — 517 | 35 | 292,913 | — 799 |
| Lincoln Corp. ... | „ 30 | 906 | 858 | — 48 | 35 | 32,752 | + 175 |
| Liverpool Corp. ... | „ 26 | 26,961 | 26,079 | — 882 | 34½ | 918,753 | — 16,972 |
| „ Motor Buses ... | „ 26 | 3,070 | 3,365 | + 295 | 34½ | 113,533 | + 15,722 |
| „ Total ... ... | „ 26 | 30,031 | 29,444 | — 587 | 34½ | 1,032,286 | — 1,250 |
| London County Coun. | Dec. 3 | 85,853 | 82,450 | — 3,403 | 35¾ | 2,920,508 | — 36,690 |
| Luton Corporation ... | Nov. 26 | 393 | 400 | + 7 | 34¾ | 14,520 | + 261 |
| Maidstone Corp. ... | „ 27 | 133 | Nil | — 133 | 34¾ | Nil | — 7,118 |
| „ Motor Buses ... | „ 27 | 335 | 268 | — 67 | 34¾ | 9,595 | — 1,232 |
| „ Trolley Buses ... | „ 27 | 276 | 539 | + 263 | 34¾ | 21,087 | + 10,470 |
| „ Total ... ... | „ 27 | 744 | 807 | + 63 | 34¾ | 30,682 | + 2,120 |
| Manchester Corp. ... | „ 29 | 35,702 | 31,719 | — 3,983 | 35 | 1,118,433 | — 104,953 |
| „ Motor Buses ... | „ 29 | 4,673 | 9,498 | + 4,825 | 35 | 307,105 | + 133,165 |
| „ Total ... ... | „ 29 | 40,375 | 41,217 | + 842 | 35 | 1,425,538 | + 28,212 |
| Middlesbrough Corp. | „ 25 | 1,127 | 926 | — 201 | 34¼ | 34,925 | — 4,078 |
| „ Motor Buses ... | „ 25 | 550 | 553 | + 3 | 34¼ | 19,346 | + 1,192 |
| „ Total ... ... | „ 25 | 1,677 | 1,479 | — 198 | 34¼ | 54,271 | — 2,886 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty.Corp. | Nov. 29 | 9,357 | 8,277 | — 1,080 | 34¾ | 299,000 | — 50,165 |
| „ Motor Buses ... | „ 29 | 1,872 | 3,566 | + 1,694 | 34¾ | 113,814 | + 43,082 |
| „ Total ... ... | „ 29 | 11,229 | 11,843 | + 614 | 34¾ | 412,814 | — 7,083 |
| Newport Corporation | „ 22 | 1,674 | 1,100 | — 574 | 34 | 47,583 | — 9,140 |
| „ Motor Buses ... | „ 22 | 742 | 1,261 | + 519 | 34 | 34,472 | + 8,744 |
| „ Total ... ... | „ 22 | 2,416 | 2,361 | — 55 | 34 | 82,055 | — 396 |
| Northampton Corp. ... | „ 28 | 1,136 | 741 | — 395 | 34¾ | 33,686 | — 4,964 |
| „ Motor Buses ... | „ 28 | 652 | 1,023 | + 371 | 34¾ | 29,690 | + 6,370 |
| „ Total ... ... | „ 28 | 1,788 | 1,764 | — 24 | 34¾ | 63,376 | + 1,406 |
| Nottingham Corp. ... | „ 27 | 6,467 | 5,567 | — 900 | 34¾ | 198,938 | — 29,763 |
| „ Motor Buses ... | „ 27 | 2,838 | 3,406 | + 568 | 34¾ | 118,131 | + 34,675 |
| „ Trolley Buses ... | „ 27 | 623 | 1,134 | + 511 | 34¾ | 41,490 | + 20,833 |
| „ Total ... ... | „ 27 | 9,928 | 10,107 | + 179 | 34¾ | 358,559 | + 25,745 |
| Oldham Corporation | „ 29 | 3,657 | 3,301 | — 356 | 36 | 120,388 | — 8,113 |
| „ Motor Buses ... | „ 29 | 1,980 | 1,843 | — 137 | 36 | 70,684 | — 1,564 |
| „ Total ... ... | „ 29 | 5,637 | 5,144 | — 493 | 36 | 191,072 | — 9,677 |
| Plymouth Corp. ... | „ 30 | 3,606 | 3,047 | — 559 | 34⁵ | 125,855 | — 6,987 |
| „ Motor Buses ... | „ 30 | 2,140 | 2,732 | + 592 | 34¾ | 88,169 | + 19,165 |
| „ Total ... ... | „ 30 | 5,746 | 5,779 | + 33 | 34¾ | 214,024 | + 12,178 |
| Portsmouth Corp. ... | „ 29 | 3,645 | 3,292 | — 353 | 35 | 148,288 | — 13,925 |
| „ Motor Buses ... | „ 29 | 1,757 | 2,928 | + 1,171 | 35 | 117,314 | + 45,192 |
| „ Total ... ... | „ 29 | 5,402 | 6,220 | + 818 | 35 | 265,602 | + 31,267 |
| Preston Corporation... | „ 26 | 1,686 | 1,639 | — 47 | 34¾ | 57,444 | — 2,452 |
| „ Motor Buses ... | „ 26 | 505 | 516 | + 11 | 34¾ | 17,873 | + 745 |
| „ Total ... ... | „ 26 | 2,191 | 2,155 | — 36 | 34¾ | 75,317 | — 1,707 |
| Rawtenstall Corp. ... | „ 30 | 872 | 630 | — 242 | 34½ | 22,578 | — 7,004 |
| „ Motor Buses ... | „ 30 | 501 | 693 | + 192 | 34½ | 24,325 | + 6,098 |
| „ Total ... ... | „ 30 | 1,373 | 1,323 | — 50 | 34½ | 46,903 | — 906 |
| Reading Corporation | „ 27 | 1,528 | 1,409 | — 119 | 35 | 50,012 | — 2,691 |
| „ Motor Buses ... | „ 27 | 938 | 1,064 | + 126 | 35 | 35,339 | + 3,507 |
| „ Total ... ... | „ 27 | 2,466 | 2,473 | + 7 | 35 | 85,351 | + 816 |
| Rochdale Corp. ... | „ 29 | 2,836 | 2,150 | — 686 | ... | 92,977 | — 8,741 |
| „ Motor Buses ... | „ 29 | 1,579 | 2,135 | + 556 | ... | 58,052 | + 2,951 |
| „ Total ... ... | „ 29 | 4,415 | 4,285 | — 130 | .. | 151,029 | — 5,790 |
| Rotherham Corp. ... | Dec. 1 | 2,735 | 2,639 | — 96 | 35 | 97,588 | + 2,348 |
| Salford Corporation ... | Nov. 30 | 11,342 | 11,092 | — 250 | 34¾ | 389,291 | — 2,374 |
| Sheffield Corp. ... | „ 29 | 21,695 | 19,924 | — 1,771 | 34¾ | 709,836 | — 26,240 |
| Southampton Corp. ... | „ 26 | 3,367 | 3,415 | + 48 | 36 | 121,108 | + 2,352 |
| „ Motor Buses ... | „ 26 | 869 | 892 | + 23 | 36 | 30,409 | + 2,867 |
| „ Total ... ... | „ 26 | 4,236 | 4,307 | + 71 | 36 | 151,517 | + 5,219 |
| Southend-on-Sea Corp. | „ 26 | 1,748 | 1,744 | — 4 | 34¾ | 77,033 | — 3,645 |
| „ Trolley Buses ... | „ 26 | 190 | 239 | + 49 | 34¾ | 11,021 | + 3,319 |
| „ Total ... ... | „ 26 | 1,938 | 1,983 | + 45 | 34¾ | 88,054 | — 326 |
| Southport Corp. ... | „ 29 | 1,183 | 1,180 | — 3 | 34¾ | 47,374 | — 663 |
| „ Motor Buses ... | „ 29 | 312 | 335 | + 23 | 34¾ | 15,056 | + 1,331 |
| „ Total ... ... | „ 29 | 1,495 | 1,515 | + 20 | 34¾ | 62,430 | + 668 |
| St. Helens Corp. ... | „ 25 | 1,930 | 2,116 | + 186 | 34¼ | 70,373 | + 3,565 |
| Sunderland Corp. ... | Dec. 2 | 2,338 | 2,036 | — 302 | 35 | 84,765 | — 1,626 |
| „ Motor Buses ... | „ 2 | 281 | 677 | + 396 | 35 | 21,901 | + 13,799 |
| „ Total ... ... | „ 2 | 2,619 | 2,713 | + 94 | 35 | 106,666 | + 12,173 |
| Swindon Corp. ... | Nov. 27 | 863 | 1,009 | + 146 | 34¾ | 34,056 | + 6,290 |
| Wallasey Corp. ... | „ 29 | 1,179 | 1,079 | — 100 | 34½ | 43,228 | — 3,515 |
| „ Motor Buses ... | „ 29 | 1,853 | 1,999 | + 146 | 34½ | 81,968 | + 7,548 |
| „ Total ... ... | „ 29 | 3,032 | 3,078 | + 46 | 34½ | 125,196 | + 4,033 |
| Walsall Corporation... | „ 23 | 3,479 | 3,748 | + 269 | 34 | 120,246 | + 3,824 |
| Walthamstow Corp. ... | „ 29 | 2,439 | 2,381 | — 58 | 34¾ | 85,932 | — 487 |
| Warrington Corp. ... | „ 27 | 924 | 925 | + 1 | 35 | 31,200 | + 202 |
| „ Motor Buses ... | „ 27 | 490 | 540 | + 50 | 35 | 17,708 | + 1,927 |
| „ Total ... ... | „ 27 | 1,414 | 1,465 | + 51 | 35 | 48,908 | + 2,129 |
| West Ham Corp. ... | „ 27 | 6,350 | 6,004 | — 346 | 34¾ | 207,780 | — 2,135 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | „ 23 | 2,753 | 2,144 | — 609 | 34 | 82,555 | — 12,795 |
| „ Trolley Buses ... | „ 23 | 3,380 | 3,551 | + 171 | 34 | 118,894 | + 5,052 |
| „ Total ... ... | „ 23 | 6,133 | 5,695 | — 438 | 34 | 201,449 | — 7,743 |
| York Corporation ... | „ 26 | 966 | 939 | — 27 | 35 | 35,928 | — 920 |
| „ Motor Buses ... | „ 26 | 444 | 587 | + 143 | 35 | 18,181 | + 4,211 |
| „ Trolley Buses ... | „ 26 | 68 | Nil | — 68 | 35 | Nil | — 1,951 |
| „ Total ... ... | „ 26 | 1,478 | 1,526 | + 48 | 35 | 54,109 | + 1,340 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or *M* | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| | | £ | £ | | £ | £ |
| Anglo-Argentine | Dec. 2 | £88,076 | £78,479 | 48 w | £3,921,262 | — £228,746 |
| Brazilian Traction $ | Oct. | 4,289,258 | 3,714,677 | 10 m | 39,781,024 | —1,440,030 |
| British Columbia $ | Oct. | 1,230,278 | 1,248,830 | 4 m | 4,846,038 | + 121,008 |
| Buenos Aires Lacroze | Nov. 30 | 11,959 | 11,349 | 22 w | 245,095 | — 13,862 |
| Burma E. Sup. Co. Rs. | Oct. | 62,905 | 64,928 | 3 m | 197,198 | + 19,376 |
| Calcutta ... Rs. | Nov. 29 | 124,108 | 104,085 | 47¼ w | 5,218,277 | — 812,287 |
| Cape Town ... ... | Oct. | 27,501 | 25,312 | ... | ... | .. |
| Carthagena & Herrerias | Nov. | 1,350 | 553 | 11 m | 8,404 | — 3,649 |
| Durban Corporation | Sept. | 22,371 | 21,156 | 2 m | 46,227 | — 1,763 |
| East India ... ... | Nov. | 3,905 | 3,507 | 4 m | 14,995 | — 1,266 |
| Kalgoorlie ... ... | Aug. | 2,100 | 2,110 | 8 m | 13,772 | + 147 |
| Madras (2 weeks) Rs. | Nov. 30 | 38,577 | 36,061 | 46 w | 1,009,196 | + 48,062 |
| Para ... ... | Oct. | 17,887 | 12,110 | 11 m | 155,610 | — 10,803 |
| Port Elizabeth ... | Oct. | 7,593 | 6,904 | ... | ... | ... |
| Rangoon ... Rs. | Nov. | 137,703 | 154,965 | 11 m | 1,658,280 | + 309,994 |
| Shanghai ... $ | Oct. | 371,611 | 445,900 | 10 m | 3,543,658 | + 175,998 |
| Singapore ... ...$ | Oct. | 133,000 | 142,000 | 1 m | 142,000 | + 9,000 |
| Winnipeg ... ...$ | Oct. | 545,308 | 523,660 | 10 m | 5,179,893 | — 216,591 |

## RAILWAY RECEIPTS.

| 48th Week ended Nov. 30th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 177,000 | — 9,000 | 335,000 | — 14,000 | 512,000 | — 23,000 | -1,334,000 |
| L.M.S.R. | 414,000 | — 27,000 | 812,000 | — 81,000 | 1,226,000 | — 108,000 | -4,632,000 |
| L.N.E.R. | 286,000 | — 19,000 | 755,000 | — 31,000 | 1,041,000 | — 50,000 | -3,025,000 |
| S.R. | 249,000 | — 11,000 | 127,000 | — 6,000 | 376,000 | — 17,000 | — 570,000 |
| Totals | 1,126,000 | — 66,000 | 2,029,000 | — 132,000 | 3,155,000 | — 198,000 | -9,561,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Nov. 29 | 288,700 | 296,700 | + 8,000 | 14,477,500 | + 743,700 |
| Lond. & Sub. Group | „ 29 | 43,100 | 43,500 | + 400 | 2,131,200 | + 114,300 |
| Metropolitan Railway | „ 29 | 36,400 | 35,900 | — 500 | 1,749,200 | + 8,300 |
| Liverpool Overhead | „ 30 | 1,586 | 1,326 | — 260 | 74,162 | — 6,818 |
| Mersey Railway ... | „ 29 | 4,557 | 4,493 | — 64 | 216,933 | + 3,196 |

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THE
# Tramway AND Railway World

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LONDON, DECEMBER 13, 1930.

## THE CHAIRMEN OF THE COMMISSIONERS.

The selection by the Minister of Transport of eleven of the thirteen chairmen of traffic area commissioners is necessarily open to criticism. Every interest would prefer stronger representation for itself, every observer will have had his own personal predilections. There may even be a feeling of disappointment after a second study of the list, in view of the claims made by Mr. Morrison in announcing the appointments to the House of Commons. He described his selections as collectively giving varying types of experience, which he considers will be of value when from time to time the chairmen will have to take counsel together. The Minister went on to enumerate three descriptions of experience, beginning with Mr. W. Chamberlain's knowledge of municipal passenger transport and his remarkable achievements in co-ordination. He also pointed to the choice of a trade union secretary familiar with labour matters in the heavy branch of road transport. His final citation was the representation given to legal experience. It is upon this point and upon another point which the Minister left unmentioned that the critics will fasten. Two King's Counsel and an ex-Colonial administrator who has qualified as a solicitor certainly constitute a liberal representation of the legal profession, and the number might well have been restricted to two. The representation which Mr. Morrison omitted to mention was that given to military officers. Even though they have had experience in the direction of transport under the War Office, it does not follow that such service qualifies them for the task of licensing omnibuses and co-ordinating road passenger services. The weakness of the list as it stands at present is that omnibus interests, and municipal transport authorities have only one representative. We can only hope that the two selections yet to be made will show that Mr. Morrison has not been forgetful of the claims of company and municipal undertakings. It is desirable that a chairman of an area should have had actual experience of the services and conditions concerning which he will have to come to decisions. In reply to that assertion it may be argued that lack of such experience in the chairmen will be compensated by the two men who are to be their unpaid colleagues in each area with the exception of the Metropolis. These commissioners will be selected by the Minister from the nominations made by local authorities. Fortunately there are among these men administrators acquainted with town and area conditions, and their knowledge and experience will be of valuable assistance in the solution of the numerous problems they will have to face. Once the commissioners commence their labours, however, it is on the personal qualities of the men themselves, rather than on the spheres in which they have last been active, that the smooth and satisfactory working of the Act will depend. On this score there can be no *a priori* objections, and it is to be hoped that in the passage of time Mr. Morrison's selection will be amply justified.

## LONDON TRAFFIC BILL.

It is understood that the Minister of Transport proposes to introduce the London Passenger Transport Bill in the House of Commons next week. At conferences with the local authorities whose undertakings are to be acquired by the proposed Board, the Minister has outlined the financial basis on which the transfer will take place. Local authorities are neither to suffer loss nor make a profit on the transaction.

It is reported that at next week's meeting of the London County Council the Special Committee on Traffic will advise the Council to oppose part of the London Traffic Bill. The part objected to confers power upon the Minister of Transport to appoint the members of the Board which is to control the pooled traffic facilities. The "News-Chronicle" understands that the Committee urges the Board should be appointed by the local authorities now managing the various undertakings.

A Committee of the City Corporation has reported upon the proposal with regard to the unification of passenger transport in the London traffic area, and the appointment of a statutory public body, such Board to function with a freedom from political interference so far as questions of management are concerned. Having regard to the peculiar conditions obtaining in London and the urgent need for a wide measure of co-ordination of the undertakings engaged in London passenger transport, the Committee recommends that general approval be given by the Corporation to the proposals of the Minister of Transport.

## BRADFORD TRANSPORT MANAGERSHIP.

SELECTED CANDIDATES—INTERVIEWS TO-DAY.

Four candidates for the appointment of general manager of Bradford Corporation Transport are to be interviewed to-day (Saturday) by the Tramways Committee, in consultation with Mr. C. J. Spencer, a former manager and now general manager of the London Underground group of tramways. The candidates are:—

Mr. C. R. Tattam, manager of the Balfour Beatty group of transport undertakings.

Mr. Richard Hoggard, general manager, Chesterfield Corporation Transport.

Mr. C. S. Jackson, assistant manager of Liverpool Corporation Transport.

Mr. C. F. Craven, for the past five years tramways expert to the Metropolitan-Vickers Electrical Co., Ltd., and formerly general manager of Reading Corporation Tramways.

A first list of three candidates were interviewed last Saturday. These were: Mr. Ben Hall, general manager and engineer, Portsmouth Corporation Transport; Mr. T. P. Sykes, general manager, Rotherham Corporation Transport; and Mr. Tattam, of the Balfour Beatty group, who has been selected for further interview to-day.

There were thirty-eight applicants for the post, which is vacant owing to the resignation of Mr. R. H. Wilkinson through ill-health. The salary offered is £1,250 a year, rising to a maximum of £1,750.

## ELECTRICITY BOARD CONTRACTS.

The Central Electricity Board has placed further contracts, amounting to about £750,000. These include switchgear for the Central England, Mid-East England, North-East England, South-East England and South-West England and South Wales schemes, orders for which have been given to the British Thomson-Houston Co., Ltd., Ferguson, Pailin, Ltd., General Electric Co., Ltd., Johnson and Phillips, Ltd., Metropolitan-Vickers Electrical Co., Ltd., and A. Reyrolle & Co., Ltd.

Contracts for transformers for the South-East England scheme have been placed with the Brush Electrical Engineering Co., Ltd.; and the English Electric Co., Ltd. Siemens Bros. & Co., Ltd., and Enfield Cable Works, Ltd., have contracts for cables required in connection with the South-West England and South Wales and the Mid-East England schemes respectively. A contract for the secondary transmission lines for the Mid-East England scheme has been placed with the J. L. Eve Construction Co., Ltd.

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## CHAIRMEN OF THE TRAFFIC COMMISSIONERS.

The Minister of Transport announced in the House of Commons on Wednesday the following appointments as Chairmen of Traffic Commissioners under the Road Traffic Act, 1930, the Chairmen to take up their duties on or about January 1, 1931 :—

ENGLAND AND WALES.

Northern : Mr. H. Riches, O.B.E., Chief Constable, Middlesbrough.

North-Western : Mr. W. Chamberlain, General Manager, Belfast City Tramways.

West Midlands : Col. A. S. Redman, C.B., M.Inst.T., R.E., formerly Assistant Director of Transport and now Assistant Adjutant-General, War Office.

East Midlands : Mr. J. H. Stirk, J.P., M.Inst.T., Transport Manager, Birmingham Co-operative Society.

South Wales : Mr. A. T. James, K.C.

Western : Mr. A. F. Nicholson, O.B.E., Chief Constable, Exeter.

Southern : Major-General Sir R. Ford, K.C.M.G., C.B., D.S.O., formerly Deputy-Quartermaster-General.

South-Eastern : Mr. Rowland Harker, K.C.

SCOTLAND.

Northern : Sir John Maxwell, C.M.G., after qualifying as a solicitor in Scotland, has held administrative posts in the Colonial Service.

Southern : Mr. A. Henderson, National Secretary, Road Transport Group (Commercial), Transport and General Workers' Union. Member of London and Home Counties Traffic Advisory Committee.

Sir E. Haviland Hiley, K.B.E., has also been appointed. He was formerly General Manager of the New Zealand Government Railways ; member of the Royal Commission on Local Government of Greater London, and Chairman of the Rhodesian Railway Commission.

The Minister stated that the estimated cost of the salaries and expenses of the Traffic Commissioners and their offices for 1931-32 was about £150,000. The chairmen's salaries would be between £15,000 and £16,000. It was not proposed to remunerate the commissioners appointed from panels nominated by local authorities, but they would be paid travelling and out-of-pocket expenses. So far as the Road Fund was concerned the £150,000 was all new expenditure, but against that, to an amount he could not state, the local authorities would save what they at present spent on their licensing functions.

Replying to Mr. Turton, the Minister said that the salaries were fixed, but he could not commit himself that a revision might not be made in the future. Generally, in making the appointments, he had selected candidates with varying types of experience, because from time to time they would meet together, and he did not want them all to be of the same experience. One was an experienced tramway manager with a special knowledge of the co-ordination of traffic. Legal experience was also represented, and he had considered it important to include a well-qualified person familiar with the conditions of labour in heavy transport on roads.

## LUNCHEON TO MR. CHAMBERLAIN.

Yesterday (Friday) an informal luncheon was given by the Municipal Tramways and Transport Association at the Arundel Hotel, London, to Mr. W. Chamberlain to congratulate him on his appointment as Traffic Commissioner for the North-West England area. Mr. R. S. Pilcher, President, presided and there was a company of about thirty-five.

THE CHAIRMAN, proposing "Our Guest, Mr. W. Chamberlain," said the announcement of Mr. Chamberlain's appointment had been received in the municipal transport industry with mixed feelings. They were exceedingly sorry he was leaving the industry and the Association, but, at the same time, they were all glad to know he was taking up such a high position, which was not only an honour to himself, but to the Association. Mr. Chamberlain had had a very strenuous time in Belfast ; the difficulties there could not have been less than those in Glasgow, but in changing to his new sphere Mr. Chamberlain would be faced with other difficulties of a different character, perhaps, but more far-reaching in their effects when they had been solved. It was the fact that a great deal of the policy which Mr. Chamberlain had enunciated during the time he was President, and in his evidence before the Royal Commission, was reflected in the Road Traffic Act. The work the Commissioners would be called upon to do, however, needed strong men who would not flinch at adopting a policy which might mean hardship to somebody. The conditions in the transport world to-day were such that in certain instances there was no room for compromise, and the decisions of the Commissioners in the public interest must mean hardship for somebody. Those who knew Mr. Chamberlain had no fear but that he would act with strict justice, irrespective of whether the interests concerned were municipal or company. The municipal transport undertakings did not desire, and had never asked for, favours. Indeed, Mr. Chamberlain himself, when acting as spokesman of the municipal transport undertakings, had made that point very strongly, and municipal operators would do well not to expect favours from Mr. Chamberlain, because they would not get preference in any shape or form.

MR. CHAMBERLAIN, in reply, expressed his sincere thanks for the kindly thought that had prompted giving this luncheon to him. He expressed appreciation of the manner in which he had always been received in the transport industry, and went on to say that the Road Traffic Act called for careful handling. Although there might be, to practical transport men, certain irritating formalities, he knew they were all big enough to brush that sort of thing on one side and view the effect of the operation of the Act as a whole. Very extensive powers were given to the Commissioners, but he was sure that any attempt to govern such an important industry as the transport industry by anything in the nature of dictation would be a failure. It could only be done by the heartiest co-operation of all. The Commissioners had been put into their positions to assist and advise, where they were qualified to advise, but they were also there to take advice and to work whole-heartedly with everybody concerned. He concluded with a reference to the happy time he had had in Belfast, which, he said, he was only leaving because he felt he could, in his new position, give effect to his ideals in a way he could not in Belfast.

MR. C. J. SPENCER proposed "The Chairman" ; and representatives from Scotland, the North-East and North-West of England, the Midlands, Wales and the South all extended their congratulations to Mr. Chamberlain.

## L.C.C. TRAMWAY MATTERS.

REVIEW OF THE FIXED STAFF OF THE DEPARTMENT.

At the weekly meeting of the London County Council on Tuesday, the Highways Committee reported that in accordance with the standing orders they had had under review the fixed staff of the tramways department, and they made the following recommendations, which had been concurred in by the Finance Committee :—

The fixed staff of the traffic operation branch to be increased by two positions of assistant divisional traffic superintendent (i.e., from 0 to 2) at a salary of £500 a year, rising by annual increments of £25 to £600 ; and reduced by one position of assistant traffic operation superintendent (i.e., from 1 to 0).

The scale of salary attaching to the two positions of divisional traffic superintendent to be £700 a year, rising by annual increments of £25 to £850, with a special allowance of £50 a year for one position in respect of special duties as deputy in charge of the traffic operation branch.

The scale of salary attaching to the position of assistant electrical engineer in the electrical branch to be £1,000 a year, rising by annual increments of £50 to £1,200.

The fixed staff of technical assistants in the electrical branch be increased by one principal technical assistant (i.e., from 0 to 1) and reduced by two senior technical assistants (i.e., from 3 to 1).

The scale of salary attaching to the two positions of car shed superintendent in the rolling stock branch to be £560 a year, rising by one annual increment of £20 to £580, and thence by annual increments of £25 to £680.

The fixed staff of the rolling stock branch to be increased by one senior technical assistant (i.e., from 1 to 2) and reduced by one technical assistant (grade 1) (i.e., from 4 to 3).

The fixed staff of the permanent way branch to be increased by one position of chief engineering assistant (i.e., from 0 to 1) at a salary of £700 a year, rising by annual increments of £25 to £800 and thence by annual increments of £50 to £900, and reduced by one position of principal technical assistant (i.e., from 1 to 0).

The designations "northern divisional engineer" and "southern divisional engineer," respectively, to be substituted for those of "assistant permanent way engineer (north)" and "assistant permanent way engineer (south)" in the permanent way branch.

The recommendations were adopted.

FAILURE OF USED TICKET RECEPTACLES.

As the result of a second experiment of twenty-nine weeks with used ticket receptacles on the Lavender Hill-Chelsea Bridge service, the Highways Committee reported that there was no justification for extension to other sections. The experiment had been in operation for two years, and the percentage of collections had risen from 8.3 to 12. In view of the disappointing results the Committee had decided to take no further action.

## BRITISH OMNIBUSES FOR CAIRO.

The first of a large consignment of British omnibuses is about to be shipped to Cairo for the Egyptian General Omnibus Co., Société Anonyme. This company has been formed under Egyptian law as a result of an important concession obtained by Commander F. T. Hare, managing director of the Overseas Motor Transport Co., Ltd., London, and John I. Thornycroft & Co., Ltd., to operate omnibus services in Cairo.

The chassis is the Thornycroft standard four-cylinder, but with left-hand drive, and the bodywork is by the Park Royal Coachworks, Ltd., London. It is a single-deck vehicle, divided into first and second class, the former compartment seating twelve and the latter fifteen. It contains several features for the special needs of Cairo, such as sunblinds and extra ventilation, and the predominant outside colour is the green of the Egyptian national flag. At present 108 of these omnibuses are on order, and others are to follow. The new service comes into operation on February 1 next.

**Brighter Cars at Bradford.**—Flood lighting is being introduced on the Bradford tramcars with the object of making travel conditions more comfortable for readers.

**Hours of Work Increased at Brisbane.**—In accordance with a decision of the Industrial Court the hours of work of Brisbane tramway employees have been increased from 44 to 48 per week. Hourly rates of pay are to be slightly reduced. In order to avoid dismissals the motormen and conductors have agreed to stand down without pay one week in eleven.

**Regenerative Control for Tramways.**—At a recent meeting of the Council of the Municipal Tramways and Transport Association the President reported upon the visit of the British delegation to Paris to witness a demonstration of regenerative control as applied to tramcars. He suggested that experiments should be conducted by the Association, and the following were appointed a committee to consider the question of collective investigation and experiments : Mr. R. Stuart Pilcher (President), Alderman A. G. Ellaway (Vice-President), Messrs. A. C. Baker, Birmingham ; J. M. Calder, Reading ; John F. Cameron, Northampton ; H. Gerrard, Glasgow ; P. Priestly, Liverpool ; and C. Owen Silvers, Wolverhampton.

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## MISCELLANEOUS NEWS AND NOTES.

**Darwen Town Council** has decided to purchase two omnibuses out of current revenues.

**Wolverhampton Town Council** on Monday last decided to convert 5.1 miles of motor omnibus route for trolleybus operation.

**Ipswich Corporation** has applied to the Minister of Transport for a Provisional Order for operating trolleybuses on seven additional routes.

**No Christmas Day Services at Halifax.**—By 30 votes to 24 Halifax Council has decided not to run tramcar or omnibus services on Christmas Day.

**Coventry to Buy Five New Cars.**—The Coventry City Council has authorised the Transport Committee to purchase five double-deck top-covered tramcars.

**Omnibuses for Newcastle.**—The Transport Committee propose to purchase fourteen single-deck and four double-deck omnibuses at a cost of £33,750.

**Newcastle to Purchase Omnibuses.**—The Newcastle City Council has authorised the Transport Committee to borrow £22,625 for the purchase of double-deck omnibuses.

**More Omnibuses for Johannesburg.**—The Johannesburg Finance Committee has approved the proposed purchase of thirteen new motor omnibuses at a cost of £23,131. Two will be double-deckers, each seating 51 passengers, and eleven single-deckers.

**Wallasey and Trolleybuses.**—A Provisional Order is to be applied for authorising the use of trolleybuses on certain routes at Wallasey. Mr. S. Panter Brick, chairman of the Tramways Committee, said they wanted the powers in case the Council decided in favour of trolleybuses.

**Gifts to Retiring Tramwaymen.**—Nine employees of Derby Tramways Department were presented with £5 notes from the Tramways Institute and Recreation Club. Mr. P. W. Bancroft, the tramways manager, made the presentations on behalf of the members.

**New Trolleybus at Middlesbrough.**—Tees-side Railless Traction Board has on trial at Middlesbrough one of the latest Guy model trolleybuses. The trolley is carried in a roof gantry attached to the sides of the vehicle, which obviates the noise when crossing joints in the wire.

**Station for the Green Park.**—The Piccadilly tube station at Dover Street, near Hyde Park, is to be closed. A new station will be erected at a cost of £200,000 under the corner of the Green Park just west of the Ritz Hotel. It is hoped to have the station open early in 1932.

**L.N.E.R. Offer to Middlesbrough.**—By a majority of six, Middlesbrough Council has referred back for reconsideration the offer of the L.N.E. Railway Co. to acquire control of the Corporation tramways and omnibuses. The Tramways Committee had recommended that the offer be rejected.

**Proposed Tramway Link-up at Wimbledon.**—London United Tramways Co., Ltd., has applied to the Ministry of Transport for consent to a junction to be made between their tramways and those of the L.C.C. at Plough-lane, Wimbledon, to enable through services to be run between the two systems.

**Bonuses for Careful Drivers.**—Glasgow Corporation Transport Committee propose to pay a bonus of £1 to all tramcar and omnibus drivers and conductors operating from the depot or garage which shows the fewest accidents during the year. Motormen already receive 1s. over their wages for every week they are immune from accidents.

**London Tramway Subway Opening.**—It will not be possible until after Christmas to resume traffic in the enlarged tramway subway from the Embankment to Southampton-row. In place of the one service run with single-deck cars there will be services from Dalston Junction to Wandsworth, Leyton to Westminster, Highbury to Brixton, and Highgate to New Cross.

**Four- or Six-Wheelers at Middlesbrough?**—The Middlesbrough Tramways Committee wish to purchase six new omnibuses, but are undecided whether they should be four- or six-wheel vehicles. The matter has been deferred until a special meeting next week, and the tramways manager, Mr. H. G. Jeken, is to obtain the opinions of other managers on the efficiency of the two types.

**Future of Kirkcaldy Transport.**—Following the recent decision of the Kirkcaldy Town Council to abandon the tramway system, the electrical engineer has reported that trolleybuses would provide cheaper service, but that a monopoly is essential for the successful working of any local transport system. The burgh surveyor reports that it would cost £22,796 to remove the rails and reinstate the roadways.

**Wages of Conductors on Transfer to Omnibuses.**—In reply to a protest against the reduction in wages of tramcar conductors on being transferred to double-deck omnibuses, Bury Tramways Committee has decided that until a National Joint Industrial Council is formed for omnibus undertakings and a national agreement is arrived at, the present wages be continued, or, alternatively, that the National Tramway Agreement should apply to the omnibus workers.

**Omnibus Wear and Tear Allowance.**—The Commissioners of Inland Revenue have agreed to the continuance of the present rate of allowances for wear and tear for Income Tax purposes for motor omnibuses, viz., 20 per cent. on the written down value, for the year 1930-31. The Board are seeking advice and information upon the question of depreciation on motor omnibuses, and hope that within a year it will be possible to arrange a settlement for a longer period.

**Oil-Electric Locomotives.**—In a paper read by Mr. C. J. Hyde Trutch, of W. G. Armstrong Whitworth & Co., Ltd., at a meeting of the Institute of Transport on December 8, it was stated that a saving of nearly £20,000,000 a year could be effected by the use of oil-electric engines on the British railways. The estimated saving would be made up of reduction in cost of maintenance £6,000,000, fuel £8,400,000, engine staff wages £4,000,000, and water £850,000.

**Hull Tramway Dismissals.**—Councillor F. E. Woodliffe proposes at the meeting of Hull City Council on Tuesday to move a resolution rescinding the decision of December 4 by which the tramway manager, Mr. E. S. Rayner, and two other officials were to receive six months' notice terminating their engagements. That motion was carried by 43 votes to 31, and it is said that some of the members have intimated their willingness to consider some other way out of the difficulty.

**A Yorkshire Change Over.**—The Yorkshire (Woollen District) Electric Tramways, Ltd., with the concurrence of the Corporations of Dewsbury and Batley, and the Urban Councils of Birstall and Birkenshaw, are to promote a Bill seeking authority for the abandonment of the tramways in the Heavy Woollen District, and for the substitution of motor omnibuses. The tramways are partly owned by certain of the local authorities and partly by the company. The substitution will probably be by stages.

**Bow Collector Gear.**—The Joint Committee of the Municipal Tramways and Transport Association and the Tramways, Light Railways and Transport Association have completed their drawings for bow collector gear. It is stated that the Associations do not propose to incur the cost of producing copies of them at present, but local authorities and companies who are members of either Association can have the loan of the drawings by applying to the secretaries of the respective Associations.

## PERSONAL.

**Major C. H. W. Edmonds** has been appointed commercial engineer to the Siemens & General Electric Railway Signal Co., Ltd.

**Mr. Sidney E. Garcke** has been elected a director of the Electric and General Investment Co., Ltd., in the place of his father, the late Mr. Emile Garcke.

**Mr. J. J. Drumm,** of University College, Dublin, has had conferred upon him by the Senate of the National University of Ireland the degree of Doctor of Science in recognition of his invention of the Drumm electric storage battery.

**Mr. A. Gray** has been appointed maintenance engineer for the North-East England scheme of the Central Electricity Board. He was formerly with the Clyde Valley Electrical Power Co. and several leading engineering companies.

**Mr. F. Massingbred Rogers** has been appointed chairman of the Board of the Greater London and Counties Trust, Ltd., which controls a number of electrical supply undertakings. The vacancy was caused by the death of Earl Birkenhead.

**Belfast Tramways Managership.**—A sub-committee has been appointed by Belfast Tramways Committee to consider and draw up the conditions of appointment for a successor to Mr. W. Chamberlain as manager and engineer of the Corporation tramway and omnibus services.

## CONTRACTS.

**Walsall Tramways Committee** has accepted the tender of British Insulated Cables, Ltd., for overhead feeder cable along the Bloxwich tramway.

**Manchester Corporation** has accepted the tender of the Metropolitan-Vickers Electrical Co. for the installation of battery-charging equipment at the Polygon Garage.

**Portsmouth Tramways Committee** has accepted the tenders of Compton, Sons & Webb for uniforms at £1,552 11s. 9d., and of Bloomfield, Ltd., for caps at £121 4s. 4d.

**Bradford Tramways Committee** has accepted the tenders of Alfred Wiseman, Ltd., Birmingham, for the supply of twenty-four tramcar gear wheels at £150, and of Brown, Bayley's Steel Works, Ltd., Sheffield, for the supply of twenty steel tramcar axles at £127 10s.

**Liverpool Corporation** has accepted the following tenders on the recommendation of the Tramways Committee: Edgar Allen & Co., Ltd., special tramway trackwork for junction of Water-street and George's Dock-gate, £880; English Electric Co., Ltd., supply of 12 car sets of electro-pneumatic control gear, suitable for multiple-unit working and rheostatic braking, £365 per set; English Electric Co., Ltd., supply of 12 pairs of equal-wheel bogie trucks, with flexible driving shafts, each bogie fitted with one D.K. 120 motor, £1,700 per pair.

## FINANCIAL ITEMS.

**L.C.C. Tramways Receipts.**—The traffic receipts for the week ended December 10 amounted to £80,373, a decrease of £5,598 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to December 10 (36 2-7 weeks) the total receipts were £3,000,897, a decrease of £43,127.

**Anglo-Argentine Tramways Co.** announces that, owing to the increased loss on exchange and the serious drop in traffic receipts, no final dividend can be paid on either the 5½ per cent. first preference shares or the 6 per cent. second preference shares for the year ended December, 1930. Drastic economies are being exercised, the directors having reduced their numbers and reduced their remuneration by two-thirds.

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**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended November 22 gave total receipts of £413,074, or £1,280 more than in the corresponding week of last year. The aggregate receipts for thirty-four weeks amounted to £14,358,628, showing an increase, with certain adjustments, of £118,501 over the corresponding period of last year.

**Cape Electric Tramways** for the year ended June 30 last show a profit of £39,091, as against £32,755. A net balance of £19,691 compares with £13,314 of the previous year. The allocation to reserve for depreciation is £10,000, while the carry forward has been increased from £36,940 to £46,631. The directors have decided to conserve the resources and do not recommend the payment of a dividend. They allude to the intensive competition of motor omnibuses.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. | Dec. 9 | 663 | 573 | − 30 | 36 | 21,212 | − 217 |
| „ Motor Buses | „ 9 | 306 | 302 | − 4 | 36 | 10,947 | + 1,889 |
| „ Total | „ 9 | 909 | 875 | − 34 | 36 | 32,159 | + 1,672 |
| Aberdeen Corp. | „ 3 | 5,070 | 4,798 | − 272 | 26¾ | 140,634 | + 2,603 |
| Ashton-u-Lyne Corp. | „ 6 | 901 | 755 | − 146 | 36 | 30,319 | − 2,748 |
| „ Motor Buses | „ 6 | 463 | 457 | − 6 | 36 | 17,737 | + 188 |
| „ Trolley Buses | „ 6 | 290 | 243 | − 47 | 36 | 9,319 | − 814 |
| „ Total | „ 6 | 1,654 | 1,455 | − 199 | 36 | 57,375 | − 3,374 |
| Ayr Corporation | Nov. 29 | 449 | 391 | − 58 | 28 | 17,348 | − 1,406 |
| Barrow Corporation | Dec. 6 | 532 | 498 | − 34 | 36 | 20,668 | − 1,175 |
| „ Motor Buses | „ 6 | 366 | 343 | − 23 | 36 | 14,777 | + 582 |
| „ Total | „ 6 | 898 | 841 | − 57 | 36 | 35,445 | − 593 |
| Belfast City | „ 5 | 11,547 | 11,139 | − 408 | 35½ | 409,359 | + 11,706 |
| „ Motor Buses | „ 5 | 1,273 | 1,382 | + 109 | 35½ | 46,929 | + 8,839 |
| „ Total | „ 5 | 12,820 | 12,521 | − 299 | 35½ | 456,288 | + 20,545 |
| Birkenhead Corp. | „ 7 | 1,516 | 1,313 | − 203 | 36 | 54,108 | − 6,265 |
| „ Motor Buses | „ 7 | 3,073 | 3,654 | + 581 | 36 | 135,935 | + 5,065 |
| „ Total | „ 7 | 4,589 | 4,967 | + 378 | 36 | 190,043 | − 1,200 |
| Birmingham Corp. | „ 2 | 28,163 | 25,301 | − 2,862 | 35 | 913,869 | − 50,984 |
| „ Motor Buses | „ 2 | 14,302 | 15,914 | + 1,612 | 35 | 549,882 | + 83,041 |
| „ Trolley Buses | „ 2 | 600 | 517 | − 83 | 35 | 18,818 | − 910 |
| „ Total | „ 2 | 43,065 | 41,732 | − 1,333 | 35 | 1,482,569 | + 31,147 |
| Blackburn Corp. | „ 3 | 1,785 | 1,602 | − 183 | 35½ | 63,617 | − 5,860 |
| „ Motor Buses | „ 3 | 330 | 336 | + 6 | 35½ | 11,459 | ... |
| „ Total | „ 3 | 2,115 | 1,938 | − 177 | 35½ | 75,076 | ... |
| Bradford Corporation | „ 6 | 9,672 | 8,788 | − 884 | ... | ... | ... |
| „ Motor Buses | „ 6 | 3,273 | 2,977 | − 296 | ... | ... | ... |
| „ Trolley Buses | „ 6 | 1,376 | 1,864 | + 488 | ... | ... | ... |
| „ Miscellaneous | „ 6 | 343 | 271 | − 72 | ... | ... | ... |
| „ Total | „ 6 | 14,664 | 13,900 | − 764 | 35 | 514,112 | − 20,422 |
| Brighton Corporation | „ 7 | 2,161 | 2,045 | − 116 | 35½ | 98,819 | + 1,431 |
| Burnley Corporation | „ 6 | 2,950 | 2,860 | − 90 | ... | ... | ... |
| „ Motor Buses | „ 6 | 666 | 706 | + 40 | ... | ... | ... |
| „ Total | „ 6 | 3,616 | 3,566 | − 50 | ... | ... | ... |
| Bury Corporation | „ 7 | 1,962 | 1,476 | − 426 | 35½ | 62,263 | − 10,097 |
| „ Motor Buses | „ 7 | 814 | 1,285 | + 471 | 35½ | 43,798 | + 24,264 |
| „ Total | „ 7 | 2,716 | 2,761 | + 45 | 35½ | 106,061 | + 14,167 |
| Cardiff Corporation | „ 6 | 7,727 | 7,391 | − 336 | 35½ | 278,244 | + 1,466 |
| Chester Corporation | Nov. 30 | 414 | Nil | − 414 | 35 | Nil | − 15,327 |
| „ Motor Buses | „ 30 | Nil | 650 | + 650 | 35 | 23,404 | + 23,404 |
| „ Total | „ 30 | 414 | 650 | + 236 | 35 | 23,404 | + 8,077 |
| Chesterfield Corp. | Dec. 8 | 2,010 | 1,882 | − 128 | 36 | 69,766 | + 645 |
| Colchester Corp. | „ 10 | 576 | 531 | − 45 | 37 | 22,347 | + 2,006 |
| Colne Corporation | „ 3 | 656 | 638 | − 18 | 35 | 24,643 | − 466 |
| Coventry Corporation | „ 7 | 2,225 | 1,911 | − 314 | 36 | 69,721 | − 7,220 |
| „ Motor Buses | „ 7 | 1,849 | 1,892 | + 43 | 36 | 64,618 | + 6,195 |
| „ Total | „ 7 | 4,074 | 3,803 | − 271 | 36 | 134,339 | − 1,025 |
| Darlington Corp | „ 6 | 1,068 | 1,029 | − 39 | 35½ | 37,884 | + 2,576 |
| Derby Corporation | „ 6 | 2,459 | 2,064 | − 395 | 36 | 86,553 | − 4,034 |
| „ Motor Buses | „ 6 | 873 | 1,127 | + 254 | 36 | 33,707 | + 6,810 |
| „ Total | „ 6 | 3,322 | 3,191 | − 141 | 36 | 120,260 | + 2,776 |
| Dover Corporation | „ 6 | 370 | 335 | − 35 | 36 | 15,594 | + 454 |
| Dundee Corporation | Nov. 18 | 2,507 | 2,456 | − 51 | 26¾ | 68,304 | − 2,294 |
| „ Motor Buses | „ 18 | 804 | 1,151 | + 347 | 26¾ | 30,579 | + 8,011 |
| „ Total | „ 18 | 3,311 | 3,607 | + 296 | 26¾ | 98,883 | + 5,717 |
| East Ham Corp. | Dec. 6 | 2,417 | 2,166 | − 251 | 35½ | 81,411 | − 426 |
| Edinburgh Corp. | Nov. 29 | 14,023 | 14,158 | + 135 | 28¾ | 422,063 | + 6,989 |
| „ Motor Buses | „ 29 | 3,396 | 3,665 | + 269 | 28¾ | 107,453 | + 8,312 |
| „ Total | „ 29 | 17,419 | 17,823 | + 404 | 28¾ | 529,516 | + 15,301 |
| Exeter Corporation | Dec. 10 | 809 | 660 | − 149 | 37 | 29,018 | − 2,964 |
| „ Motor Buses | „ 10 | 226 | 378 | + 152 | 37 | 12,754 | + 6,846 |
| „ Total | „ 10 | 1,035 | 1,038 | + 3 | 37 | 41,772 | + 3,882 |
| Glasgow Corporation | Nov. 29 | 45,383 | 42,077 | − 3,306 | 26 | 1,126,734 | − 18,031 |
| „ Motor Buses | „ 29 | 6,781 | 10,307 | + 3,526 | 26 | 236,064 | + 87,518 |
| „ Total | „ 29 | 52,164 | 52,384 | + 220 | 26 | 1,362,798 | + 69,487 |
| Gloucester Corp. | Dec. 3 | 674 | 722 | + 48 | 35½ | 25,514 | + 4,649 |
| Grimsby Corporation | „ 6 | 1,489 | 1,491 | + 2 | 36 | 57,496 | + 5,491 |
| Halifax Corporation | „ 2 | 4,976 | 4,939 | − 37 | 35½ | 181,618 | + 17,507 |
| Huddersfield Corp. | „ 6 | 6,379 | 6,066 | − 313 | 36 | 229,068 | − 2,780 |
| Hull Corporation | „ 6 | 6,323 | 5,733 | − 590 | 36 | 206,851 | − 9,899 |
| „ Motor Buses | „ 6 | 1,521 | 1,802 | + 281 | 36 | 59,270 | + 9,448 |
| „ Total | „ 6 | 7,844 | 7,535 | − 309 | 36 | 266,121 | − 451 |
| Ilford Corporation | „ 6 | 1,542 | 1,512 | − 30 | 35½ | 54,374 | + 710 |
| Ipswich Corp. Trol.Bus | „ 6 | 1,291 | 1,254 | − 37 | 35½ | 48,740 | + 2,410 |
| Isle of Thanet | „ 3 | 376 | 345 | − 31 | 48¼ | 39,627 | − 4,612 |
| Kilmarnock Corp. | „ 6 | 493 | 471 | − 22 | 23½ | 14,563 | + 557 |
| Lancashire Un. | Nov. 30 | 4,374 | 4,604 | + 230 | 47½ | 237,318 | + 28,460 |
| „ Motor Buses | „ 30 | 2,313 | 2,157 | − 156 | 47½ | 101,978 | − 5,869 |
| Leeds Corporation | Dec. 6 | 17,594 | 17,018 | − 576 | 35½ | 630,357 | − 4,934 |
| „ Motor Buses | „ 6 | 1,912 | 2,277 | + 365 | 35½ | 83,127 | + 15,065 |
| „ Total | „ 6 | 19,506 | 19,295 | − 211 | 35½ | 713,484 | + 10,131 |
| Leicester Corp. | „ 6 | 8,789 | 8,413 | − 376 | 36 | 301,326 | − 1,157 |
| Lincoln Corp. | Nov. 30 | 906 | 858 | − 48 | 35 | 32,752 | + 175 |
| Liverpool Corp. | Dec. 3 | 27,444 | 25,910 | − 1,534 | 35½ | 944,664 | − 18,507 |
| „ Motor Buses | „ 3 | 3,135 | 3,338 | + 203 | 35½ | 116,870 | + 15,925 |
| „ Total | „ 3 | 30,579 | 29,248 | − 1,331 | 35½ | 1,061,534 | − 2,582 |
| London County Coun. | „ 10 | 85,971 | 80,373 | − 5,598 | 36¼ | 3,000,897 | − 43,127 |
| Luton Corporation | „ 3 | 400 | 381 | + 19 | 35½ | 14,901 | + 242 |
| Maidstone Corp. | „ 4 | 134 | Nil | − 134 | 35½ | Nil | − 7,252 |
| „ Motor Buses | „ 4 | 339 | 253 | − 86 | 35½ | 9,848 | − 1,318 |
| „ Trolley Buses | „ 4 | 288 | 533 | + 245 | 35½ | 21,620 | + 10,715 |
| „ Total | „ 4 | 761 | 786 | + 25 | 35½ | 31,468 | + 2,145 |
| Manchester Corp. | „ 6 | 35,457 | 31,256 | − 4,201 | 36 | 1,149,689 | − 109,194 |
| „ Motor Buses | „ 6 | 4,795 | 9,381 | + 4,586 | 36 | 316,486 | + 138,752 |
| „ Total | „ 6 | 40,252 | 40,637 | + 385 | 36 | 1,466,175 | + 29,558 |
| Middlesbrough Corp. | „ 2 | 1,109 | 964 | − 145 | 35½ | 35,889 | − 4,223 |
| „ Motor Buses | „ 2 | 590 | 566 | − 24 | 35½ | 19,912 | + 1,168 |
| „ Total | „ 2 | 1,699 | 1,530 | − 169 | 35½ | 55,801 | − 3,055 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name | Week ended | Latest Return. 1929 | 1930 | + or − | Aggregate. Wks. | 1930 | + or − |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Tv.Corp. | Dec. 6 | 9,585 | 8,220 | − 1,365 | 35¾ | 307,220 | − 51,130 |
| „ Motor Buses | „ 6 | 1,953 | 3,622 | + 1,669 | 35½ | 117,336 | + 44,651 |
| „ Total | „ 6 | 11,538 | 11,842 | + 304 | 35½ | 424,556 | − 6,879 |
| Newport Corporation | Nov. 29 | 1,749 | 1,093 | − 656 | 35 | 48,676 | − 9,796 |
| „ Motor Buses | „ 29 | 784 | 1,266 | + 482 | 35 | 35,738 | + 9,226 |
| „ Total | „ 29 | 2,533 | 2,359 | − 174 | 35 | 84,414 | − 570 |
| Northampton Corp. | Dec. 5 | 1,126 | 730 | − 396 | 35¼ | 34,416 | − 5,359 |
| „ Motor Buses | „ 5 | 675 | 1,021 | + 346 | 35¼ | 30,711 | + 6,716 |
| „ Total | „ 5 | 1,801 | 1,751 | − 50 | 35¼ | 65,127 | + 1,357 |
| Nottingham Corp. | „ 4 | 6,524 | 5,489 | − 1,035 | 35½ | 204,425 | − 30,800 |
| „ Motor Buses | „ 4 | 2,880 | 3,569 | + 689 | 35½ | 121,701 | + 35,365 |
| „ Trolley Buses | „ 4 | 624 | 1,187 | + 563 | 35½ | 42,678 | + 21,397 |
| „ Total | „ 4 | 10,028 | 10,245 | + 217 | 35½ | 368,804 | + 25,962 |
| Oldham Corporation | „ 6 | 3,592 | 3,141 | − 451 | 37 | 123,529 | − 8,564 |
| „ Motor Buses | „ 6 | 1,954 | 1,754 | − 200 | 37 | 72,439 | − 1,763 |
| „ Total | „ 6 | 5,546 | 4,895 | − 651 | 37 | 195,968 | − 10,327 |
| Plymouth Corp | „ 6 | 3,724 | 3,195 | − 529 | 35¾ | 123,050 | − 7,517 |
| „ Motor Buses | „ 6 | 2,205 | 2,823 | + 618 | 35¾ | 90,992 | + 19,782 |
| „ Total | „ 6 | 5,929 | 6,018 | + 89 | 35¾ | 220,042 | + 12,265 |
| Portsmouth Corp. | „ 6 | 3,832 | 3,390 | − 442 | 36 | 151,678 | − 14,367 |
| „ Motor Buses | „ 6 | 1,818 | 2,879 | + 1,061 | 36 | 120,193 | + 46,253 |
| „ Total | „ 6 | 5,650 | 6,269 | + 619 | 36 | 271,871 | + 31,886 |
| Preston Corporation | „ 3 | 1,709 | 1,552 | − 157 | 35¾ | 58,996 | − 2,610 |
| „ Motor Buses | „ 3 | 517 | 491 | + 26 | 35¾ | 18,364 | + 519 |
| „ Total | „ 3 | 2,226 | 2,043 | − 183 | 35¾ | 77,360 | − 1,891 |
| Rawtenstall Corp. | „ 7 | 919 | 611 | − 308 | 35½ | 23,189 | − 7,312 |
| „ Motor Buses | „ 7 | 515 | 668 | + 153 | 35½ | 24,993 | + 6,250 |
| „ Total | „ 7 | 1,434 | 1,279 | − 155 | 35½ | 48,182 | − 1,062 |
| Reading Corporation | „ 4 | 1,638 | 1,427 | − 211 | 36 | 51,440 | − 2,962 |
| „ Motor Buses | „ 4 | 968 | 1,039 | + 71 | 36 | 36,379 | + 3,578 |
| „ Total | „ 4 | 2,606 | 2,466 | − 140 | 36 | 87,819 | + 676 |
| Rochdale Corp. | „ 6 | 2,792 | 2,088 | − 704 | ... | 95,066 | − 9,499 |
| „ Motor Buses | „ 6 | 1,593 | 2,137 | + 544 | ... | 60,190 | + 3,496 |
| „ Total | „ 6 | 4,385 | 4,225 | − 160 | ... | 155,256 | − 6,003 |
| Rotherham Corp. | „ 1 | 2,735 | 2,639 | − 96 | 35 | 97,588 | + 2,348 |
| Salford Corporation | „ 7 | 11,271 | 10,865 | − 406 | 35½ | 400,156 | − 2,815 |
| Sheffield Corp. | „ 6 | 21,303 | 19,739 | − 1,564 | 35½ | 729,575 | − 27,803 |
| Southampton Corp. | „ 3 | 901 | 871 | + 30 | 36 | 31,281 | + 2,832 |
| „ Motor Buses | „ 3 | 3,497 | 3,337 | − 160 | 36 | 124,446 | + 2,165 |
| „ Total | „ 3 | 4,398 | 4,208 | + 190 | 36 | 155,727 | + 4,997 |
| Southend-on-Sea Corp. | „ 3 | 1,790 | 1,718 | − 72 | 35¼ | 78,750 | − 3,718 |
| „ Trolley Buses | „ 3 | 193 | 232 | + 39 | 35¼ | 11,254 | + 3,359 |
| „ Total | „ 3 | 1,983 | 1,950 | − 33 | 35¼ | 90,004 | − 359 |
| Southport Corp. | „ 6 | 1,176 | 1,109 | − 67 | 35½ | 48,483 | − 730 |
| „ Motor Buses | „ 6 | 312 | 317 | + 5 | 35½ | 15,373 | + 1,336 |
| „ Total | „ 6 | 1,488 | 1,426 | + 62 | 35½ | 63,856 | + 606 |
| St. Helens Corp. | „ 2 | 2,019 | 2,025 | + 6 | 35¼ | 72,398 | + 3,571 |
| Sunderland Corp. | „ 9 | 2,403 | 2,066 | − 337 | 36 | 86,832 | − 1,963 |
| „ Motor Buses | „ 9 | 294 | 688 | + 394 | 36 | 22,589 | + 14,192 |
| „ Total | „ 9 | 2,697 | 2,754 | + 57 | 36 | 109,421 | + 12,229 |
| Swindon Corp. | „ 3 | 856 | 974 | + 118 | 35¾ | 35,030 | + 6,409 |
| Wallasey Corp. | „ 6 | 1,174 | 1,049 | − 125 | 35½ | 44,277 | − 3,640 |
| „ Motor Buses | „ 6 | 1,847 | 1,877 | + 30 | 35½ | 83,845 | + 7,578 |
| „ Total | „ 6 | 3,021 | 2,926 | + 95 | 35½ | 128,122 | + 3,938 |
| Walsall Corporation | Nov. 30 | 3,598 | 3,708 | + 110 | 35 | 123,954 | + 3,935 |
| Walthamstow Corp. | Dec. 6 | 2,464 | 2,296 | − 168 | 35½ | 88,229 | − 655 |
| Warrington Corp. | „ 7 | 959 | 892 | − 67 | 36 | 32,092 | + 135 |
| „ Motor Buses | „ 7 | 500 | 503 | + 3 | 36 | 18,211 | + 1,930 |
| „ Total | „ 7 | 1,459 | 1,395 | − 64 | 36 | 50,303 | + 2,065 |
| West Ham Corp. | „ 4 | 6,412 | 6,033 | − 359 | 35¾ | 213,814 | − 2,513 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses | Nov. 30 | 2,767 | 2,157 | − 610 | 35 | 84,711 | − 13,405 |
| „ Trolley Buses | „ 30 | 3,498 | 3,611 | + 113 | 35 | 122,505 | + 5,165 |
| „ Total | „ 30 | 6,265 | 5,768 | − 497 | 35 | 207,216 | − 8,240 |
| York Corporation | Dec. 3 | 1,043 | 930 | − 113 | 36 | 36,858 | − 1,033 |
| „ Motor Buses | „ 3 | 473 | 559 | + 86 | 36 | 18,740 | + 4,297 |
| „ Trolley Buses | „ 3 | 72 | Nil | − 72 | 36 | Nil | − 2,024 |
| „ Total | „ 3 | 1,588 | 1,489 | − 99 | 36 | 55,598 | + 1,240 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name | Week or M'th. | Latest Return. 1929 | 1930 | Aggregate. Wks. or *M* | 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Dec. 9 | £92,481 | £80,186 | 49 w | £4,001,448 | − £241,041 |
| Brazilian Traction $ | Oct. | 4,289,258 | 3,714,677 | 10 m | 39,781,024 | − 1,440,030 |
| British Columbia $ | Oct. | 1,230,278 | 1,248,830 | 4 m | 4,846,038 | + 121,008 |
| Buenos Aires Lacroze | Dec. 7 | 12,798 | 12,222 | 23 w | 257,317 | − 14,438 |
| Burma E. Sup. Co. Rs. | Oct. | 62,905 | 64,928 | 3 m | 197,198 | + 19,376 |
| Calcutta ... Rs. | Dec. 6 | 125,868 | 105,317 | 48½ w | 5,323,594 | − 832,838 |
| Cape Town ... ... | Oct. | 27,501 | 25,312 | ... | ... | ... |
| Carthagena & Herrerias | Nov. | 1,350 | 553 | 11 m | 8,404 | − 3,649 |
| Durban Corporation | Sept. | 22,371 | 21,156 | 2 m | 46,227 | − 1,763 |
| East India ... ... | Nov. | 3,905 | 3,507 | 4 m | 14,995 | − 1,266 |
| Kalgoorlie ... ... | Aug. | 2,100 | 2,110 | 8 m | 13,772 | + 147 |
| Madras (2 weeks) Rs. | Nov. 30 | 38,577 | 36,061 | 46 w | 1,009,196 | + 48,062 |
| Para ... ... | Oct. | 17,887 | 12,110 | 11 m | 155,610 | − 10,803 |
| Port Elizabeth ... | Oct. | 7,593 | 6,904 | ... | ... | ... |
| Rangoon ... Rs. | Nov. | 137,703 | 154,965 | 11 m | 1,658,280 | + 309,994 |
| Shanghai ... $ | Nov. | 360,247 | 430,394 | 11 m | 3,974,052 | + 246,145 |
| Singapore ... ...$ | Nov. | 126,000 | 134,000 | 2 m | 276,000 | + 17,000 |
| Winnipeg ... ...$ | Oct. | 545,308 | 523,660 | 10 m | 5,179,893 | − 216,591 |

## RAILWAY RECEIPTS.

| 49th Week ended Dec. 7th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 190,000 | − 10,000 | 331,000 | − 15,000 | 521,000 | − 25,000 | −1,359,000 |
| L.M.S.R. | 415,000 | − 28,000 | 826,000 | − 53,000 | 1,241,000 | − 81,000 | −4,713,000 |
| L.N.E.R. | 299,000 | − 10,000 | 638,000 | − 59,000 | 937,000 | − 69,000 | −3,094,000 |
| S.R. | 245,000 | − 11,000 | 90,000 | + 1,000 | 335,000 | − 10,000 | − 580,000 |
| Totals | 1,149,000 | − 59,000 | 1,885,000 | − 126,000 | 3,034,000 | − 185,000 | −9,746,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or − | Aggregate. 1930. | + or − |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Nov. 6 | 292,600 | 299,300 | + 6,700 | 14,776,800 | + 750,400 |
| Lond. & Sub. Group | „ 6 | 43,400 | 43,500 | + 100 | 2,174,700 | + 114,400 |
| Metropolitan Railway | „ 6 | 37,400 | 35,800 | − 1,600 | 1,785,000 | + 6,700 |
| Liverpool Overhead | „ 7 | 1,653 | 1,406 | − 247 | 75,568 | − 7,065 |
| Mersey Railway | „ 6 | 4,646 | 4,743 | + 97 | 221,678 | + 3,293 |

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THE Tramway & Railway World
WITH OMNIBUS & COACH SECTION
Founded 1892 LONDON, DECEMBER 18, 1930 VOL. LXVIII

# DONCASTER TROLLEY-OMNIBUS SYSTEM.

By T. POTTS,
*General Manager, Doncaster Corporation Transport.*

In the year 1921 the Doncaster tramway system was found to be hopelessly inadequate to cope with the traffic, and steps were at once taken to deal with the situation. The tramways, consisting of single track and loops, totalled 18·65 miles of track, and even at that time were suffering from motor-omnibus competition. The system had undoubtedly been handicapped since its inception in the year 1902 by (1) the manner in which the track was laid, owing to bad foundations; (2) the type of rail adopted, which was of the centre-groove type; and (3) the long-term loan of forty years. The inevitable result was that although the track was worn out in 1921 and really unfit for cars to run over, 50 per cent. of the debt had still to be repaid. While the undertaking did not yet show a loss on the balance sheet, it was really living on capital. It was this handicap which made it very difficult to see how to put the system in good running order without making it a charge on the rates.

Three alternative schemes were then considered by my Committee, viz.: (*a*) To relay the existing single track, making improvements where possible by extending the length of the loops; (*b*) to relay with double track; and (*c*) to scrap the tramway system altogether and substitute either trolley or petrol omnibuses.

With regard to (*a*), it was considered that the undertaking could never be operated satisfactorily, as it would be too slow and cumbersome for modern needs, so that this scheme did not receive very serious consideration. Scheme (*b*) was most carefully considered by my Committee. The cost was estimated at £151,000, involving an annual additional charge of about £11,500, and while it was agreed that it would improve the working of the system it would not necessarily bring in more revenue. To increase the revenue it would have been necessary to carry out further extensions with a corresponding increase in capital amounting to £60,000. This, added to the cost

Double Bracket Arm Construction on the Great North Road.

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of relaying the old tramway track, would have given a total of £211,000 and the system would then have been seriously over-capitalised.

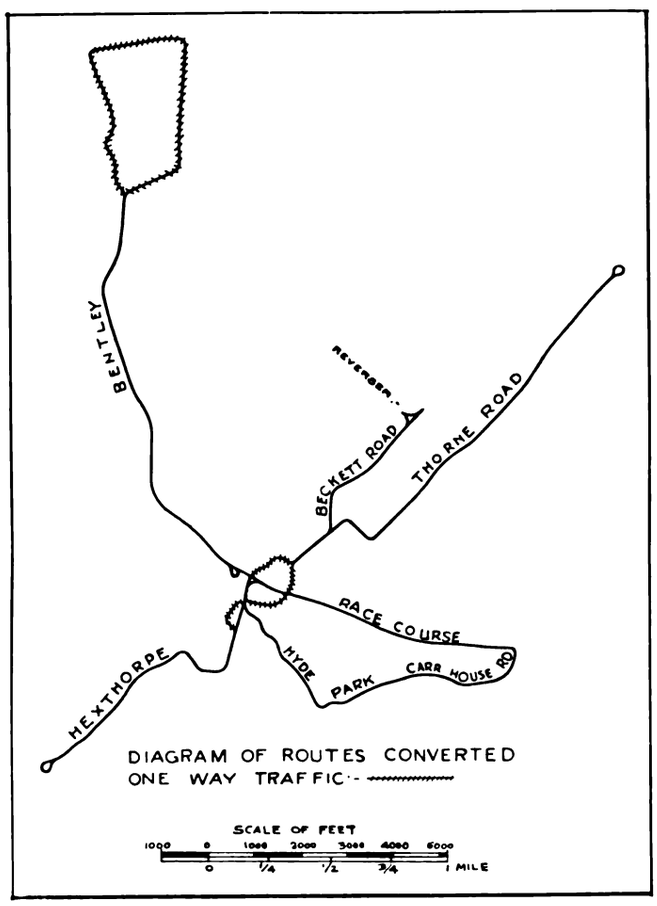
Both these schemes were eventually rejected, and it was decided to scrap the tramway system altogether and to substitute either trolley or petrol omnibuses in accordance with scheme (*c*). The question of which of the two types of vehicles to adopt was then given most careful consideration, and it was decided to promote a Bill giving Powers to operate petrol omnibuses and trolley vehicles. In 1922 a tramway route was abandoned and it was replaced by a petrol omnibus service.

In a very short time it became apparent that this class of vehicle would be extremely expensive to operate, owing to the high average number of stops per mile, and its very short life. On a certain route in Doncaster it was found that the actual running time from terminus to terminus was ten minutes, and a record taken of the time occupied in picking up and setting down passengers during the journey showed a total of two minutes. This being a fifth of the actual time taken on the journey it was argued, not unreasonably, that for a fifth of the running time the petrol engine was wearing itself out and not earning any revenue. Consequently it was thought that the saving in wear and tear over any constantly running prime mover would be the aggregate amount of time occupied in picking up and setting down passengers.

Again, it was considered that a high maximum speed was not desirable, nor was it possible to take advantage of it in our streets, but maximum acceleration and deceleration were essential to maintain a high schedule speed. My Committee also felt that if they had very heavy commitments in the form of motor omnibuses they would be more or less at the mercy of the petrol

Converted Routes —— Proposed Routes - - - -

or benzole combines. Trolleybuses, on the other hand, used home-produced power, namely, electricity, which was supplied from our own generating station; it also gave employment to local colliery workers, and tended to flatten out the peaks in the generating station loads, which, in turn, made for cheaper current for household and factory purposes. The last-mentioned factor was by no means negligible if Doncaster was to develop for industrial purposes.




Route Diagram showing One-way Traffic System.

Following this train of reasoning, in 1926 a Bill was promoted to enable the Corporation to run trolley omnibuses and powers were subsequently obtained. In 1928, Bentley, the first tramway route of 2·25 miles, was converted. This line originally consisted of single track and loops laid on a very bad foundation, and owing to the narrow width of the road the tramway track had to carry practically the whole of the other vehicular traffic, with consequent heavy road charges which fell on the tramways department—these road charges had in fact averaged £5,300 per annum for twelve years. An extension of 1·40 miles was made to the route in order better to serve the public.

It was found possible with trolleybuses to cut down the driver's time from 40 minutes to 32 minutes for the round trip, in spite of an increase in the number of stops and the additional length of line mentioned. This rate of speed will be further improved upon when the road works are completed. Passenger traffic increased 45 per cent., and we obtained many passengers who had been in the habit of riding on competing motor omnibuses.

The success of this conversion decided my Committee to convert further routes which have already been opened for trolleybus traffic. These routes show an average increase in traffic receipts of 38 per cent., and a 20 per cent. increase in running speed.

Thorne Road, originally a tramway route, was in 1922 converted to motor omnibus operation. This has

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now been transformed into a trolleybus route and will shortly be open for traffic. Balby is also about to be converted. The following tramway routes have now been converted for trolley omnibus operation, having a total length of 11·3 route miles inclusive of new extensions, which are shown on the accompanying key plan, viz., Bentley, Hexthorpe, Beckett Road, Race Course, Carr House Road, Hyde Park, Thorne Road.

Considerable care has been exercised in the general layout of the system having in view the obtaining of

Reconstructed Road in High Street.

a high schedule speed for the vehicles. Terminal loops and reversers have been reduced to a minimum as will be seen from reference to the accompanying diagram of converted routes. The Race Course, Carr House Road and Hyde Park sections form a circular route, the vehicles operating in both directions. The Bentley section has only one terminal loop at the town end, the vehicles operating at the Bentley end on a circular one-way traffic route. The Hexthorpe section has also only one terminal loop, the vehicles turning by a one-way traffic route in the town. The Beckett Road section is terminated by a reverser owing to the limited road width. The frogs on the reverser are automatic in action, which enables the vehicles to be reversed in a period of only 40 seconds. The Beckett Road and Thorne Road sections also operate upon the one-way traffic principle at the town end, due to the narrow roads, and in order to reduce traffic delays to a minimum.

It is partly due to the higher schedule speed of the trolleybus service over that of the old tramcars that the routes converted show the above-mentioned average increase in traffic receipts. During the past two and a quarter years since the inauguration of the system, the trolleybuses have operated a total of over 700,000 miles, some of the earlier vehicles having exceeded 68,000 miles. It is the extended experience thus acquired which has encouraged the Corporation to convert the remaining sections of the system.

Realising the necessity of having a first-class overhead installation if the trolleybuses were to be a success, and appreciating that the average tramway overhead work is not good enough for trolleybuses, practically the whole of the old tramway overhead equipment was scrapped. The conversion of the overhead equipment was carried out by a firm of contractors who had previous experience in the conversion of several other similar tramway systems. The problem that presented itself was to erect the trolley wires so that the vehicles could be driven to the kerb or to the centre of the roadway with equal freedom, and to enable them rapidly to overtake slower-moving vehicular traffic without trolley dewirements. This has been successfully accomplished, and a trolley-boom dewirement is of rare occurrence.

Considerable care has been exercised in attaining this end. All junction wiring was plotted out on large-scale plans and agreed in advance of the actual wiring. In some instances several alternative schemes had to be prepared by the contractors for approval, and to meet varying traffic conditions. All pole positions and sizes were, in a similar manner, plotted on route plans. By this means the overhead equipment was erected in its final position in the first instance, which ensured against subsequent alterations. The policy has been to erect the overhead equipment to give the highest possible scheduled speed and a life of at least twenty years with a minimum cost in maintenance.

The original poles had been erected for a period of 28 years. Fortunately, however, although small in diameter, they were over $\frac{3}{8}$ in. in thickness when new, and in consequence all poles having a minimum thickness of $\frac{3}{16}$ in. at points where the greatest oxidisation had taken place, were re-erected as span poles on straight portions of the route and where the roads did not exceed a width of 30 ft., and were re-employed for single bracket-arm poles for one-way traffic, carrying only one pair of trolley wires. New medium-sized poles were used for span construction for roads exceeding 30 ft. in width and for bracket-arm poles carrying two pairs of trolley wires, both on straight parts

Single Bracket Arm Construction.

of the route and moderate curves. New heavy poles were used for right-angle bends, junctions, terminal loops and reversers.

The cadmium trolley wire is of 3/0 s.w.g. round section, grooved trolley wire having been avoided owing to the smaller wearing surface on each side of the wire due to the groove. All section insulators, negative sections and insulated crossings were of the contractor's own special designs and fitted with non-hammering ends to ensure against crystallisation of the trolley wire

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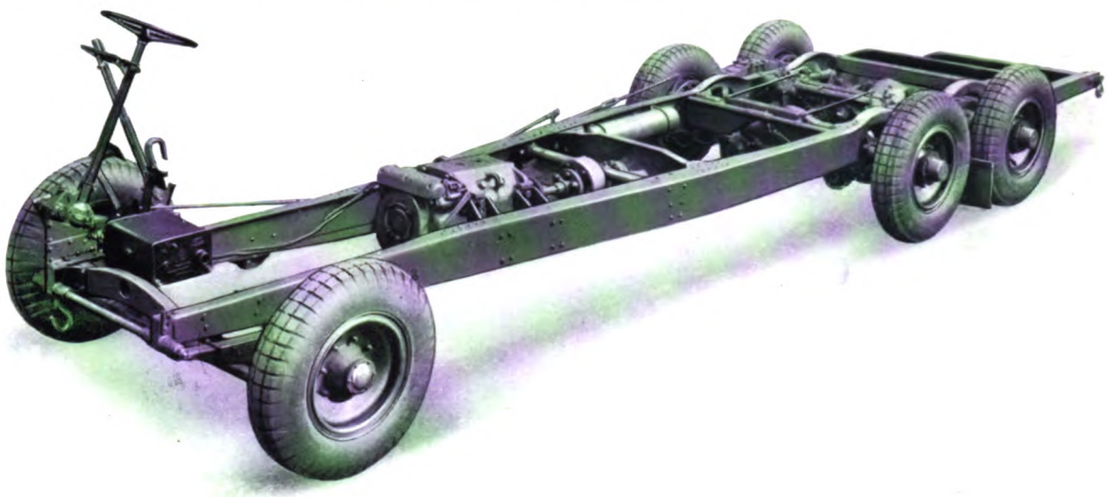
immediately at the ends of such fittings after extensive service.

With the exception of the first four, the chassis were supplied by the contractors, Messrs. Clough, Smith & Co., Ltd., and are of the Karrier-Clough E.6 type, 19 of which are in operation. The chassis, manufactured by the Karrier Motors, Ltd., and fitted with B.T.H. motor and contactor controller, are of the rigid-frame six-wheel type, 28 ft. in length. The single motor is suspended from the side members between the front and rear axles. The twin rear axles are of bogie construction and of the inverted worm-driven type, the gearing of each axle being mounted as a self-contained unit removable from the main casing. The wheels are mounted on taper roller bearings. The rear bogie is fitted with two pairs of semi-elliptic springs, each pair being free to swivel on a central fulcrum bracket attached to the frame. Each frame side member encircles the axles, being pressed out in banjo form to allow for axle movement and also for withdrawal when necessary. The laden height of frame from ground level is 2 ft. 1 in. The detachable disc wheels are fitted with 36 in. by 8 in. single pneumatic tyres.

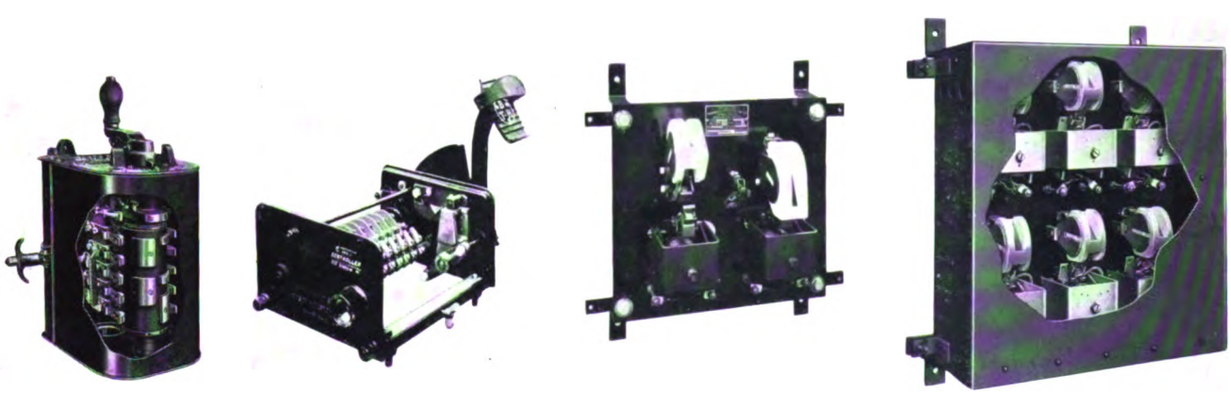
Pneumatic pressure brakes of the internal expanding type are fitted to all four driving wheels, and are operated by foot pedal. The air compressor is driven by means of a special electric motor. Incorporated in the air-pipe circuit is an electrical compressor governor which automatically controls the operation of the compressor so that at a predetermined air pressure the driving motor is switched off and cuts in again only when the air reservoir pressure drops below the predetermined minimum. Two gauges are mounted on the steering column indicating the air pressure in the reservoir and brake cylinders respectively. The hand-brake lever operates the transmission brake, which is 15 in. in diameter. This is also of the internal-expanding type.



Karrier-Clough Six-wheel Chassis.

The electrical equipment consists of a single motor suitable for foot-operated control gear, manufactured by the British Thomson-Houston Co., Ltd. The motor—type B.T.H.508-D—is rated at 66 H.P. on 525 volts, 1,365 R.P.M. for one hour, and has a continuous rating of 75 amperes.

This motor has a cast-steel frame in one piece, provided with two frame heads of light-weight alloy in which the armature is carried in roller bearings. The windings are of the normal traction 4-pole design with commutating poles, and the machine is self ventilated in parallel paths in accordance with modern practice. The motor shaft is coupled through a universal joint to a cardan shaft of normal design and differential drive to the two rear axles.



B.T.H. Contactor Control Equipment.

The controller consists essentially of a pedal-operated master controller, a number of magnetic contactors mounted on suitable panels, and a reverser. The

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advantages claimed for this method of operation are :—

(1) Pedal operation is essential with this class of vehicle so as to leave the driver's hands free for steering and applying the hand brake.

(2) There is complete absence of burning at the contacts of the foot-operated controller, due to its handling control current only, no ratchet notching device is required.

(3) The effort required from the driver for operation is reduced to a minimum, due to the small contacts in the master controller and comparatively light return spring.

(4) Low general maintenance of both controller and contactors.

The master controller is a small drum controller provided with a geared operating sector to which is secured a suitable pedal plate and lever. The controller is arranged so that when the pedal is depressed against the operating spring the controller is moved towards the "on" position, and returned by the spring to the "off" position. Five resistance points are provided, the sixth point being the full field running position.

In this position a stop is provided in the controller so that it is impossible for the driver to depress the pedal further without a small but definite backward movement of the pedal towards the "off" position, thus releasing the stop and allowing the driver to depress the pedal to the seventh point. On this last point a diverter resistance is connected across the series field of the motor, thus increasing the maximum speed of the trolleybus.

The contactors are mounted on two panels of light-weight insulating compound, provided with asbestos-lined sheet-metal covers, and corner-supporting brackets. Each contactor is complete with its own individual blow-out coil arc chute, and 500-volt operating coil. The contactors are of the self-cleaning type, closing with a combined sliding and rolling action The arc chutes are pivoted so that they can be raised for examination of the contacts, and the operating coils can be moved by loosening one nut.

On the smaller panel two contactors only are mounted. These are of the 150-ampere continuous size, and have their contacts connected in series. Their function is to open and close the line circuit in the first accelerating point, the double break ensuring that this function is adequately performed even in exceptional circumstances. On the larger panel six contactors are mounted. These are of the 80-ampere continuous size, five being utilised for short-circuiting the sections of starting resistance, while the sixth contactor connects the diverter resistance across the motor field on the last control point.

The contactor control circuit is made through a segment of the master controller on the first resistance point only, and subsequently by means of an interlock on one of the two line contactors. This ensures that the power circuit cannot be remade after interruption without returning the master controller on the first point, and re-inserting the whole of the starting resistance.

Karrier-Clough Six-wheel Trolley Omnibus.

The reverser is a small drum controller arranged for hand operation, and provided with three positions only : off, forward and reverse. This controller reverses the armature of the motor, and is provided with auxiliary contacts so arranged that it is impossible to close or retain closed any of the contactors except when the reverser is in one of the two running positions.

The bodies were manufactured by Messrs. Chas. H. Roe, Ltd., of Crossgates Carriage Works, Leeds. A considerable amount of time was given to the design of the body, firstly because of the longer service

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expected from a trolleybus, which fact is governed by the loan period, and secondly the stresses imposed by the trolleys on the general structure, such stresses being not only in a rearward direction but side-pull having also to be provided for.

The greater acceleration in a trolleybus has also to be taken into account in the construction of double-deck bodies where a considerable top-deck load is carried. It was, therefore, decided to build the main structure in Burma teak following the generally accepted principles of tramcar practice.

Seating for 60 passengers was provided, a strong seat upholstered in leather being preferred to moquette. The lower saloon is ventilated through the driver's cab by means of air ducts and glass louvres fitted outside the windows, which have a permanent opening of 1 in. at the top. In the top saloon there are side sliding windows. In the later vehicles a drop window has been fitted in the centre of the front bulkhead, so that in very hot weather a through current of air can be obtained. It has been found, where an enclosed back staircase is fitted, that an up-current of air is created, and, therefore, some means had to be taken to ventilate the air that became cushioned at the end of the upper saloon; this was done by means of two small permanent openings at the end of the saloon with glass louvres to keep the rain from driving in.

The floor framing is arranged to give free access to the motor, differentials, and air compressor, the main framing of the floor being in English oak and the floor boards slatted on both bottom and top decks. The side framing on both decks is of Burma teak, and has embodied the Roe patent method of pillar and waist rail jointing, and their standard method of ventilating the panels below the waist rails. The panels of the lower saloon are of steel and the upper saloon of

Interior of Lower Saloon.

mahogany. The upper saloon has no interior casings below the waist rails, and the framing is finished off in the natural grain and varnished.

"Doverite" covered handpoles with "gripfast" non-rattle brackets are fitted to the ceilings of both upper and lower saloons. Stanchions are fitted in both saloons and are so placed as to provide proper support for the trolleys right through to the floor framing in the lower saloon. All interior metal work is done away with as far as possible, but where it has been necessary stainless steel or chromium plated fittings have been used.

The lighting of both upper and lower saloons is by means of bulkhead-type lamps mounted in the underdrawn portion of the ceilings, making a neat and efficient lighting system. The interior decorative scheme is light oak. The mouldings are all of neat section, give an attractive appearance, and do not call for much cleaning. Pilkington's plate glass is used throughout for the windows.

Destination boxes have been provided at the front, operated from the driver's cab, at the rear fitted in the upper framing of the top deck operated by the conductor, also one on the nearside in the lower saloon to

Interior of Upper Saloon.

enable passengers standing immediately at the side of the vehicle to see the destination. A route box is also used and is fitted in the main framing at the front of the top saloon.

The staircase is fitted with suitable handrails, all "Doverite" covered, with "Doverite" covered brackets. The entrance gives easy access to the upper or lower saloons without overcrowding the platform. The exterior is painted in the standard Doncaster colours, maroon and cream.

The first four chassis were supplied and manufactured by Messrs. Richard Garrett & Sons, Ltd., Leiston, and answer generally to the above description, with the exception that they are fitted with a series parallel motor of Bull manufacture.

The conversion of the overhead equipment has been carried out by Messrs. Clough, Smith & Co., Ltd., of 36, Victoria Street, Westminster, London, S.W.1, which firm also supplied the Karrier-Clough trolleybus chassis.

## NEW TRAMCARS AT HOBART.

A single-deck bogie tramcar, the first of three new types of cars designed and constructed at the shops of the Hobart Tramways (Tasmania), has been put in service. The car is of the convertible type, and can be changed quickly from two- to one-man control. The car measures 46 ft. in length, 8 ft. in width, and from floor to roof 8 ft. There are two compartments divided by central entrances with double sliding doors on either side. The platform entrances at each end are controlled with single sliding doors; all the doors are hand operated and are hung on "Beclawat" patent ball-bearing runners. This is the first of this type of hanger to be used in Australia. The bogie trucks are each fitted with a pair of 34-H.P. motors supplied by the English Electric Company, Ltd. The length between wheel centres is 5 ft. 2 in., and the wheel base 21 ft. 2 in. The Westinghouse air brake system is used.

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## A CENTRAL-ENTRANCE TRAMCAR.

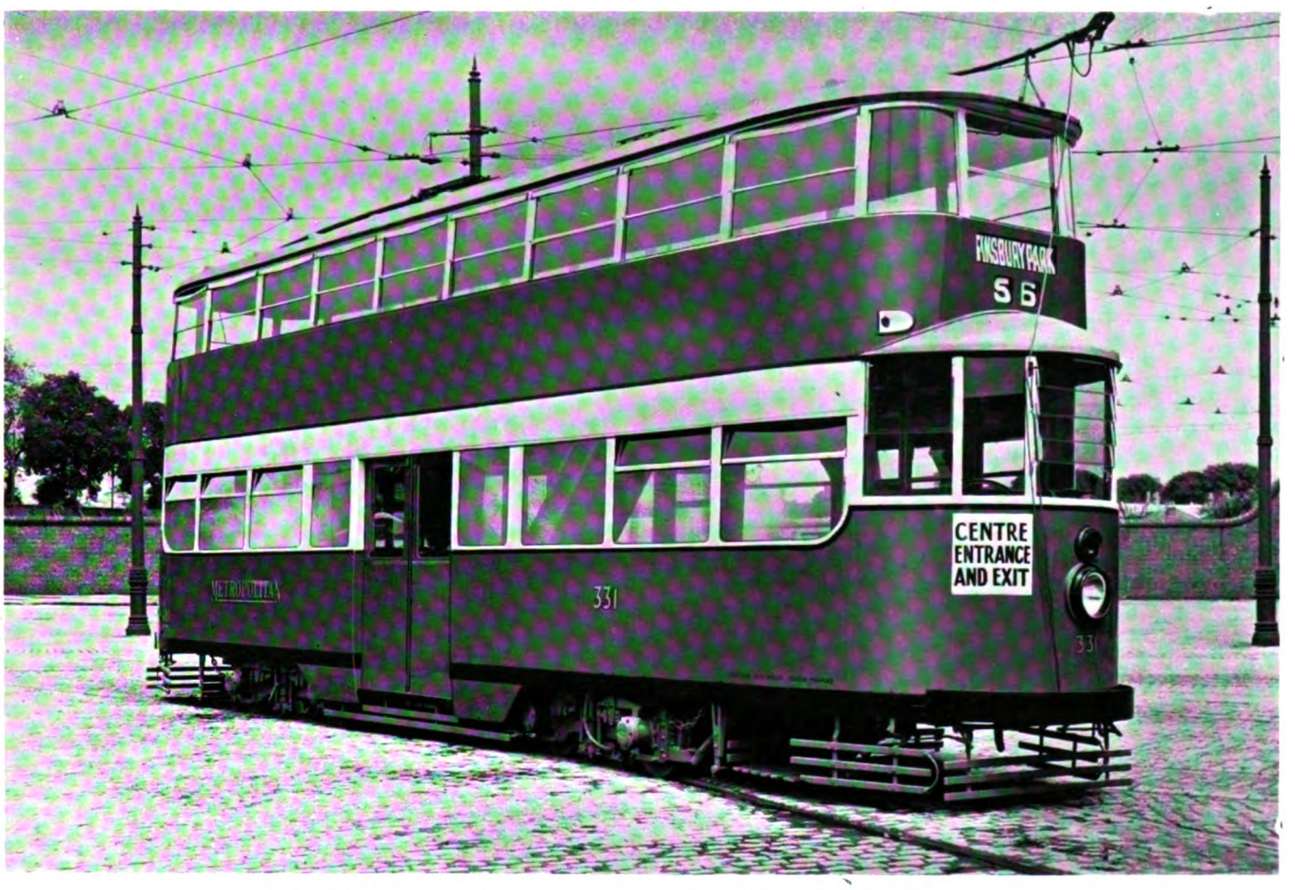
EXPERIMENTAL MODEL OF THE METROPOLITAN ELECTRIC TRAMWAYS.

The latest experimental tramcar introduced by the two companies forming part of the London Underground group (Metropolitan Electric Tramways and London United Tramways), in their quest of the vehicle best suitable for present-day traffic needs, is of the central-entrance type. It is one of three experimental cars constructed to their order by the Union Construction Co., of Feltham. The first was introduced in the spring of 1929, and the second in November, 1929, both having a rear entrance and a front exit. These two cars were described and illustrated in THE TRAMWAY AND RAILWAY WORLD of April 18, 1929, and November 21, 1929, respectively.

The object of constructing three experimental cars was to obtain experience under operating conditions of certain novel features and then to combine the best of these in one standard design. This object has now been achieved and 54 of the new type are under construction for the Metropolitan Electric Tramways and 46 for the London United Tramways. The first to be supplied are now put in service on the L.U.T. system.

The central-entrance car, which is now running between Cricklewood and North Finchley, is a revolutionary design in this country, and is notable for its spaciousness and comfort. Its total length is 40 ft. 3¾ in.; extreme width 7 ft. 2 in.; height, running rail to top of roof, 14 ft. 7 in.; height, floor to ceiling, lower saloon, 6 ft. 2 in.; height, floor to ceiling, upper saloon, 5 ft. 11 in. The underframe is built up of mild-steel rolled sections, plates and pressings assembled, the whole being riveted together. A low floor height to the lower saloon necessitated the body bolster being of shallow construction. The body is mounted on equal wheel bogies having wheel brake blocks.

A low step leads through the central doorway to a commodious platform extending the full width of the doors on either side. On opposite sides, right and left, are two stairways, and being on the offside of the car, the motorman can, if necessary, view the near-side doors from his compartment. This arrangement permits of rapid loading and unloading, and lends itself to the adoption of the pay-as-you-enter system. Under each stairway is a cupboard which holds the gear controlling the doors. From each side of the platform the floor of the saloon is raised, the floor being of fluted boards, installed in wide sections. The flooring of the upper saloon is of similar material.




Central-Entrance Tramcar of the Metropolitan Electric Tramways

Accommodation is provided for 70 seats, 28 in the lower saloon and 42 in the upper. Downstairs there are longitudinal and a few cross seats, upholstered in moquette. Upstairs the seats are principally transverse and are upholstered in dark blue leather. The cross seats are of special design, the ironwork and reversing mechanism being hidden from view and so disposed as to prevent injury to passengers. The mechanism also tilts the seat when reversing so that the front edge is always slightly elevated, thus increasing the comfort of the seat. The handgrips are filled with a web, as in the last experimental car.

In the lower saloon five windows on each side have the top portion hinged, and can be controlled by

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passengers by simply pulling them forward to open and pushing back to close. The nine windows on each side of the upper saloon can all be operated by passengers, the top half being arranged to drop, leaving an opening of 11 in. The end windows are of safety glass. When the ventilator windows are closed they are water-tight, so that the inside of the car is completely protected against rain.

### The Motorman's Compartment.

The floor of the motorman's compartment is raised above the saloon floor, which enables the motorman, while seated, to see the area of the central doors. This raised platform also has the advantage of allowing a standard height controller to be used, the base of which is placed below the raised floor. Further, the seated motorman's line of vision is on the same level as that of a standing motorman on one of the company's standard-type tramcars. At each end the compartment is divided from the lower saloon by a partition which is glazed with safety glass above the waistline. Blinds mounted on the motorman's side are fitted to the partition window to prevent reflections from the inside lights. A swing door is provided in this partition, which swings into the lower saloon. Fixed on the door is an ingenious seat for the motorman. The action of occupying the seat operates a bolt which slips into the floor so that the door cannot be blown open nor opened by unauthorised persons from the saloon side. Should the motorman fall or be knocked from his seat the seat tips up when unoccupied and the bolt is automatically withdrawn, when the door can be opened.

In front of the motorman is a specially developed adjustable louvre-type windscreen, which can be opened or closed to suit weather conditions. A hinged window, opening inwards, is fitted on the left-hand side of the compartment, so that the motorman can "look out" on the near side, and a similar window is provided on the right side. In addition to the controller, air and hand brake, sanding, sliding doors, and trap tray control mechanism, all of which are placed so that they may be conveniently operated by the seated motorman, the lighting switches and fuses, automatic circuit breakers, signal bells, line contactor, compressor switch and indicator control mechanism are located in the motorman's compartment.

The motors comprise four 35-H.P. 300-volt of the General Electric Co.'s type W.T.18.

### The Doors and their Operation.

A pair of sliding doors on each side provide the central entrance. When opening, they slide into pockets arranged on the body side, and the front edges are protected by special sensitive edges to prevent injury to passengers or damage to their clothing. Each door is operated by a separate air engine and is controlled by the motorman and the conductor. A special device in the control mechanism prevents the doors from opening if the car is travelling at more than two miles per hour, so that the impetuous passenger is protected against himself. The doors are inter-locked with the traction circuit so that the car cannot be started by the motorman until the interlocks are closed. The doors are closed by the conductor by means of control buttons placed over the doors, one button for each pair of doors, the near-side doors being operated by the button on the offside and *vice versa*, so that the conductor is clear of the doors he is closing. By means of a double-push button the conductor can open the doors in an emergency. The controls are so arranged that neither the conductor nor the motorman can inadvertently open the doors on the offside of the car. An emergency handle is fitted over each pair of doors so that anyone can by pulling this handle release the air from the door engines and they can then be pulled apart by hand. An operating cock enables the staff to open the doors from the outside.

Electric-bell pushes are fitted in both saloons and ring differently toned bells in the motorman's compartment. The conductor can signal from his door control position by means of "Numa" pneumatic bells. The different toned bells enable the motorman to distinguish whether the signal is from the upper or lower saloon or the conductor's platform.

### Brake Equipment.

The car is equipped with the Westinghouse Brake and Saxby Signal Co.'s straight air-brake. The cylinders are synchronised in action so that the brakes are applied on both trucks simultaneously. Over each pair of sliding doors also there is a lever which passengers can use in emergency to apply the brake. Magnetic track brakes are fitted to the trucks, but are not inter-connected with the wheel brakes. Peacock staffless handbrake operating mechanism is provided in each motorman's compartment. The compressed air for brakes, sanding gear and doors, is supplied by a KLL2 two-stage rotary-type air compressor which is direct-coupled to a 500-volt D.C. motor, the whole of this equipment being totally enclosed and carried under the car. This compressor has an output of approximately 11 c. ft. of air per minute at 100 lb. pressure per square inch.

Interior of the Central-Entrance Tramcar

### Lighting Equipment.

Special attention has been paid to the lighting of both saloons so as to provide a good light for reading and to eliminate shadows. There are 24 lamps in the lower saloon, four on the central platform, and 20 in the upper saloon. A dipping headlight is fitted on the front of each dash, and can be operated by the motorman so that during foggy weather a beam can be projected on to the track. A caution light for the benefit of following traffic is fitted in the centre of each dash immediately above the dipping headlight. This is operated by the motorman by a hand switch and gives warning that the tramcar is about to stop, the word "stop" appearing on a red background. Should the motorman forget to press the caution switch the light

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automatically comes up when the doors are opened. The police lights can be used, if required, to illuminate the motorman's compartment.

The equal wheel trucks have road wheels of 24 in. diameter, and a wheelbase of 4 ft. 9 in. The trucks are of the swing-bolster type with axle boxes of the roller-bearing type, in which is incorporated an end location ball-bearing. The truck frames are built up of mild-steel plates and sections. The swing bolsters are so designed as to permit of a pre-determined weight being carried on the side rubbing blocks with a view to eliminating roll of the car body. Single-block wheel brakes are fitted on the trucks.

Pneumatic sanding equipment is operated by an attachment fitted to the motorman's brake valve, and ensures a continuous flow of sand until the brake is released.

The body tapers slightly towards the top, giving additional clearance, this being also a feature of the last experimental car. All exposed fittings are of bright chromium plating.

It will be interesting to see how many and which of the features of the three experimental tramcars have been incorporated in the new standard design. At any rate it has been decided that the central entrance will not be one, as no more of this type are to be constructed.

## LONDON TRAMWAY SUBWAY.

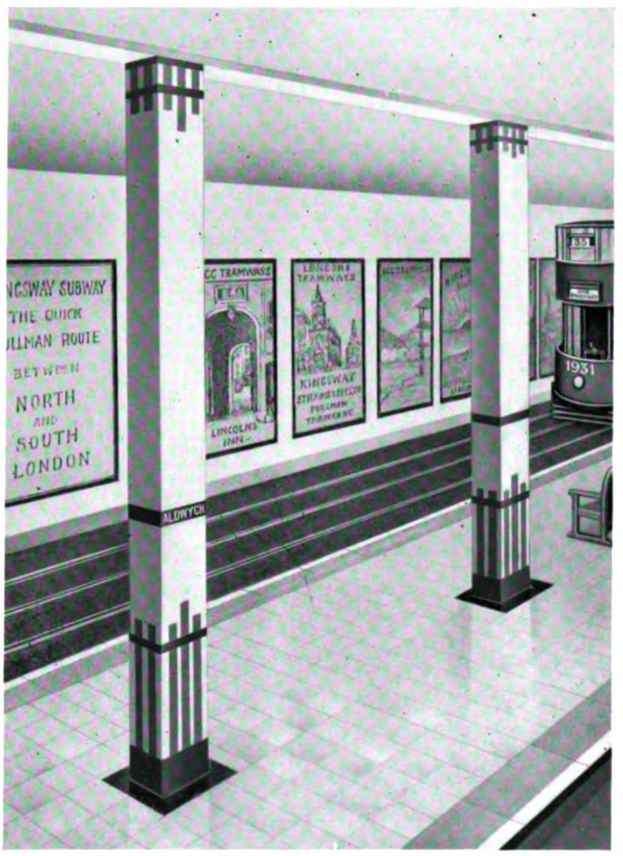
RE-OPENING TO TAKE PLACE AFTER CHRISTMAS.

Notwithstanding the great efforts of the contractors and of the permanent way staff of the London County Council to render possible an earlier opening of the enlarged tramway subway between the Victoria Embankment and Southampton Row, the Tramways Department has announced that it will not be possible to resume passenger transport until after Christmas. The date has not yet been fixed, although all arrangements have been made for the new services to be given by double-deck cars in place of the old single-deck cars. The first car to run through the subway will be painted white.

The deepening of the subway to enable double-deck cars to be operated between South and North London was begun on February 3 last, and no public work has ever been carried out more expeditiously in London. Between three and five hundred men have been engaged in the task night and day with only a weekly halt between noon on Saturday and 10 p.m. on Sunday. The main contractors are John Cochrane & Sons, Ltd., civil engineers, of Westminster, and the cost of the enlargement has been about £170,000. To obtain the additional head-room the track has been lowered by approximately 5 ft. in the southern half of the subway, while in the northern half the roof has been raised. The old concrete floor was demolished by pneumatic drills, and the side walls were underpinned with concrete to the required depth. The most delicate engineering operation took place under the busy Strand, where the subway goes west before turning south to the Embankment, which is entered at the side of Waterloo Bridge. Under the Strand the bottom halves of the two cast iron tubes which formed the double tunnel were removed, and walls of concrete were built to carry the top halves of the tubes. Temporarily the top halves were supported on timber.

The soil removed was largely the stiff blue clay that underlies London. In all 27,500 cubic yards of earth were excavated, 16,600 being clay and ballast and 10,900 concrete and brickwork. New construction comprises 15,900 cubic yards of concrete and brickwork, 600 tons of steelwork, 135 tons of cast iron. Approximately 1,135 tons of cast iron were removed.

Passengers will not recognise the greatly altered Aldwych and Holborn stations. We reproduce an illustration of the Aldwych station. Both stations have been rebuilt and modernised, and both are more commodious. At Holborn the platform has been lengthened by as much as two-thirds. Marble and stone mosaic in soft colours are used for the paving of the platforms. The supporting columns and walls




The New Aldwych Station of the Kingsway Subway.

of the short staircases, leading to the Kingsway are of the same materials, but highly polished. Contrasting the station interiors with the glazed white tiles used for the old stations, the change is very great. One of the stones is travertine, which was used by the builders of ancient Rome, notably for the Colosseum. Travertine stone is of cream colour, and is utilised at Holborn station.

In readiness for the re-opening, the Tramways Department has prepared a pamphlet and map showing the new through services to be given by the double-deck cars in place of the one service from Highgate to the Elephant provided by the single-deck cars. The new routes will be from Hackney to Wandsworth, from Leyton to Westminster, from Highbury to Brixton, and from Highgate to New Cross. For the first time South London will be linked with East London. There will be thirty cars an hour in each direction in the subway.

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THE
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The Editor will consider contributions offered for publication in THE TRAMWAY AND RAILWAY WORLD (including the Omnibus and Coach Section) by those conversant with the subjects that come within the scope of this journal. All information of a practical character relating particularly to the engineering and operating branches of transportation will receive prompt attention. Original illustrations will also be welcome.

LONDON, DECEMBER 18, 1930.

**Proposed London Traffic Board.**

The publication of the Parliamentary notice foreshadowing the introduction of a Government Bill to unify the passenger services of the extensive area included in the London Traffic Act, 1924, does not indicate that all is yet plain sailing for the Minister of Transport. One thing it does signify is that the Minister has no desire to incur the delay that would result if the notice had not been given at this juncture. We have yet to hear that he has prepared proposals that will be approved by the undertakings concerned, and notably the Underground Traffic Group and the London County Council. All that is known as yet is that Mr. Morrison intends, to an unexpected extent, to adopt commercial methods in the affairs of the proposed Board, instead of trying to induce Parliament to institute an experiment on Socialistic lines. That much is common knowledge derived from Mr. Morrison's own speeches. The Minister is now engaged in placing before the various undertakings the proposals upon which he hopes to secure their support, without which the prospects of the Bill would be hopeless. On the financial side, the way appears to have been cleared somewhat by a report presented to the Minister by Sir Wm. McLintock, the chartered accountant, after consideration of information supplied in confidence by the privately owned concerns. Important details have evidently not yet been agreed upon. The constitution of the Board is one. Is it to be on the lines of the Central Electricity Board or a merger such as the Port of London Authority and the Metropolitan Water Board? An early intimation was given to the Minister as to the measure of commercial management that would have to be instituted in order to gain the support of the directors responsible for conduct of the largest traffic interest. On the occasion of the last annual meeting of the shareholders of the Underground Group, Lord Ashfield, the chairman, stated that he and his colleagues were prepared to give this Government, as to any other Government, loyal collaboration in proposals they might bring forward if those proposals would not be prejudicial to the shareholders' interests or cause injury to their undertakings, and would afford the management the same measure of freedom which they now enjoy and permit the undertakings to remain capable of progressive development.

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**The Manager's Powers.**

In some places managers of municipal transport undertakings still suffer from the interference of committees whose members have an eye on the voters or on which the parish pump mind predominates. Mr. Morrison was indirectly referring to such types of public representatives when at the annual dinner of the Municipal Tramway and Transport Association he urged that the efficient manager must be made to feel that he is a business man first and a municipal officer afterwards, and that short of committing the council on questions of policy and finance, he, together with his chairman, must have the right to take urgent decisions. Fortunately, most of our municipalities are blessed with capable transport managers, but some misguided members of committees, however capable they may be in other directions, have an impression that they are not performing their public duty unless they usurp the work of the expert. Some managers are indeed men of outstanding ability; these suffer little from interference with managerial functions and are well able to look after themselves in committee. Others, able enough at their real job,

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lack the dexterity of mind to deal satisfactorily with difficult committees, and they are hampered in their work by inconsiderate meddling and attempts to keep both policy and management in the committee's hands. This reduces the efficiency of the whole undertaking, as no business can be operated successfully by any committee unless the manager is allowed wide powers and freedom of action. If the committee decide policy, with the advice of the manager as to the feasibility of particular proposals, and regard themselves as a board of directors working only for the success of the undertaking and the satisfaction of public requirements, leaving the manager to carry out that policy with his expert knowledge of transport operation, they will be exercising that businesslike management which Mr. Morrison is so anxious to see.

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**Traffic Planning.**

City development and traffic planning are not abstract problems to be left to police departments or to untrained groups to solve. This criticism has been made by Mr. G. A. Richardson, general manager of the Chicago Surface Lines, and it deserves to become a truism. The railway managements, Mr. Richardson adds, must be most active in discovering proper planning and in education towards adequate timely development. The importance of this desideratum in Great Britain may be stressed because of three considerations. One is that the general increase of motor vehicle traffic in considerable centres of population has created a problem. Another is that in several towns the local authority has appointed a committee to prepare schemes for the better conduct of traffic. The third is that committees working under the Town Planning Act are in existence in numerous places. However enthusiastic and competent the members of such committees may be, it is clear that their work cannot achieve fruition unless they have had the benefit of consultation with the men who are daily engaged in traffic working. In this connection we include public and private conveyances and also commercial vehicles. In fact, the committee should be modelled on the lines of the London and Home Counties Committee, which advises the Minister of Transport in matters affecting that area. Not the least useful aspect of the committee's work is the number of suggestions for street improvements that find a place in their annual report. The importance and the pressing necessity of adopting many of the proposals is not diminished by the fact that very few of them are carried into effect by the County and Borough Councils. Finance is the barrier. A strong case can be advanced for urging that larger grants should be made from the Road Fund. This and other aspects of the traffic problem would receive much-needed ventilation if traffic men and local authorities were brought into closer association.

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**Tramway Substitutions.**

Decisions to substitute other forms of passenger transport for tramways have been more numerous during the year now ending than in any prior twelve months. In the majority only sections of the undertakings are affected, but in some cases the whole of the tramways are to be replaced Outside the largest towns undoubtedly there will be other decisions to abandon the tramways in whole or in part. This conclusion is to be drawn from the fact that the year has been notable for the number of deputations, from both British and Continental towns, which have visited towns to inspect trolleybus systems already in operation. This desire to investigate on the spot the economics of the system and learn from experience the ease and comfort of the latest vehicle, is natural where an undertaking is approaching the time when it must be reconstructed or an alternative system adopted. Reconstruction, however, is a serious matter because the prices of materials remain so high as to render it a matter of some risk. Hence the change-over to the trolleybus, although it must be remembered that a great many towns favour the petrol omnibus. The trolleybus, besides being almost noiseless and smoothly operated, adds to these and other advantages freedom from anxiety as to interruption of the petrol supply and variations in its price now that a Chancellor of the Exchequer has taxed it to the tune of sixpence a gallon. These facts constitute a powerful reinforcement of the desire to preserve the traction load for the

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municipal or other local electricity station. Where there is still hesitation on the part of operators, two other considerations may influence a decision in favour of the trolleybus. One is that when the Electricity Commissioners have completed their work, the charge for power should show an important reduction. The other is that decisions arrived at by Parliament last session, notably in the case of Bradford, enable the trolleybus to serve routes extending beyond the borough or city boundary. Again, such extensions were granted without the obligation to pay exorbitant road charges demanded by the county councils, so that the trolleybus is as free from this imposition as is the petrol omnibus. For inter-urban communication the advantages of the railless system are considerable, and the lower fares at which it can be operated give it an important advantage over both the tramcar and the petrol omnibus.

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**Oil-Electric Locomotives.**

It is noteworthy that at the very time when prospects are promising for the use of heavy-oil engines on omnibuses, attention is being directed afresh to the question of applying such engines to railway traction. In the case of railways, however, it is proposed that the oil engine should be combined with an electric drive, similar apparently to that well-known contrivance for omnibuses, the petrol-electric drive. Though there are a number of varieties of heavy-oil engine, they are evidently all based on the Diesel principle—that is, ignition of the charge in the cylinder is effected by the heat produced by the compression stroke of the piston. Owing among other things to the low cost of heavy oil, engines on the Diesel principle show great economy over petrol engines and steam engines. A most optimistic forecast of the financial savings to be effected on British railways if oil-electric engines were generally substituted for steam locomotives was given before the Institute of Transport on December 8 by Mr. C. J. H. Trutch, of the Diesel electric traction department of Sir W. G. Armstrong Whitworth & Co. According to Mr. Trutch such a substitution would result in a saving of £20,000,000 per annum in the operating costs of British railways. He gave some cogent reasons for his belief, but more experimenting will have to be done before a final conclusion can be reached. A point of particular interest to those concerned in the operation of road traffic is that Mr. Trutch envisages the running of rail motor coaches fitted with oil-electric engines on branch lines of light traffic which would be able to compete successfully with omnibuses on the roads. He thinks it would be possible to run what would practically amount to a motor omnibus service on railways of light traffic. Stops would be made at halts and level crossings. Among points which will arise in the critical mind are that rail motor coaches of one kind and another have for years been tried on branch lines with more or less success, that the fuel for the oil-electric engine has at present to be imported, and that on the other hand the possibility of producing fuel oil from coal on a commercial scale appears to be increasing.

## FIFTY NEW CARS FOR BELFAST.

Several of the fifty new tramcars ordered by Belfast Corporation are now in service. A fully illustrated description will be given in a later issue. Meanwhile it may be said that the bodies and trucks are the most up-to-date products of their respective manufacturers, and were built to the specifications of Mr. W. Chamberlain, the general manager of the tramways. Seating accommodation is provided for 68 passengers, 24 in the lower saloon and 44 in the top saloon. The majority of the upstairs seats and also most of those on the platform level are of the transverse tilting spring-framed type, and are upholstered in leather. Ventilation and lighting have received careful attention. Each car is fitted with thirty-two 40-watt 105-volt lamps. It is also proposed to heat each saloon electrically. Platforms are partly enclosed, and the motorman's wind-screens are of non-splinterable glass. Forty of the bodies are being constructed by the Brush Electrical Engineering Co., the remaining ten being by the Service Motor Works, of Belfast. Maley & Taunton, Ltd., of Wednesbury, are providing the single trucks, frames, and brake equipment. Wheels and axles are by Leeds Wheel & Axle Co., the axles being of Brown Bayley's Impacta steel. The truck is equipped with the Maley-Taunton "New System" brakes, which comprise an air track brake and magnetic brake and an air wheel brake. Electrical equipments are by the British Thomson-Houston Co. Each truck has two 50-H.P. motors. The motors have roller bearings and are series-wound for 500 to 550-volt circuit. The controllers are of the series parallel contactor type, fitted with notching device and run-back preventers. Before the general work in connection with the contract was begun a sample car was erected complete for inspection and approval. The approximate weight fully loaded is 18 tons.

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## HYDRAULIC LIFTING PLANT FOR SOUTH INDIAN RAILWAYS.

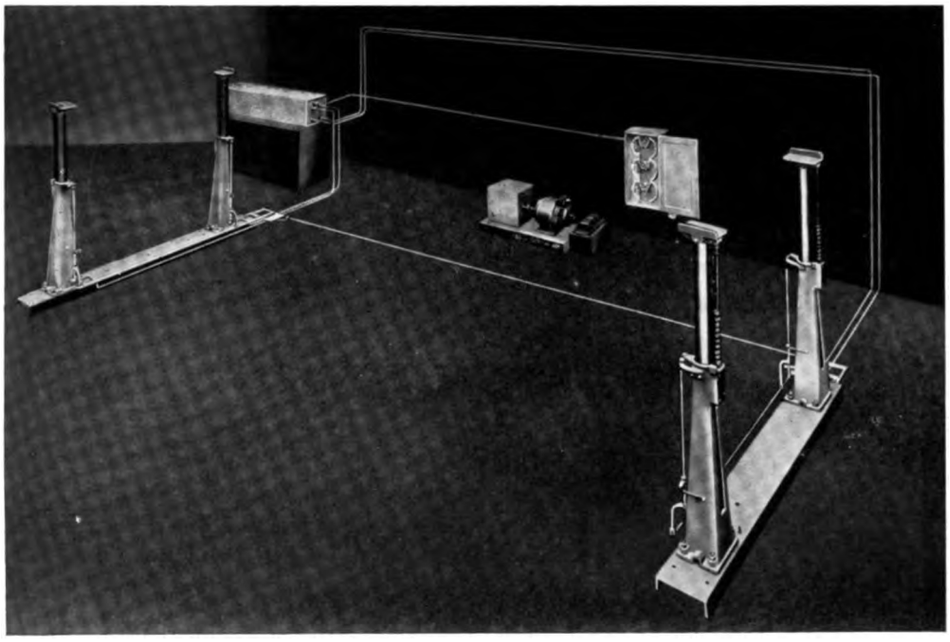
NEW AND ECONOMICAL SYSTEM.

The South Indian Railways have recently purchased a remarkable " Skyhi " hydraulic lifting plant, manufactured by Messrs. Henry Miller & Co., which is in course of installation in their overhaul shops in Madras. The plant has been specially designed for dealing with the three-car electric train units and has been chosen in preference to an overhead crane. It is estimated that the work to be done by these jacks could only have been handled by other lifting apparatus costing at least four times as much. In addition to this saving in first cost the system possesses the advantages of simplicity of operation and low maintenance cost; and waste time and energy will be reduced to a minimum. The plant consists of three lifting units of four jacks each arranged along the track so that the train can be driven into position, and then, after the necessary uncoupling and unbolting, the bodies of the three coaches are successively raised clear of the trucks by a turn of the handle controlling each lift unit. The trucks are swung round on turntables, removed, and replaced by others on to which the bodies are lowered and secured.

Power for the jacks is supplied by a 5-H.P. electric motor coupled, through a 5 to 1 reduction gear, to a six-cylinder swashplate oil-pump. This pump feeds oil under pressure, according to the position of the control valve, to one of the three displacing sets, each of which actuates a group of four lifting jacks. In the displacing unit there is a centre cylinder and four cylinders of equal diameter completely submerged in oil. The four cylinders are separately connected by feed pipes to the four jacks. Thus when oil from the power pump is forced into the centre cylinder a crosshead, carrying four sliding rams which work in the four cylinders, in turn forces oil into the lifting jacks and causes them to rise at an equal rate. On lowering, the load carried by the jacks returns the oil to the cylinders of the displacing set. The final stage of lowering must, however, be completed by the diversion of oil pressure to a retrieving cylinder situated on the uppermost part of the displacing unit. By this means the displacing rams are driven right back until small ports in the cylinders are uncovered, thus allowing oil outside the cylinders to enter and replace any loss that may have occurred during operation. When the power is cut off from the retrieving cylinder four heavy section springs return the rams just far enough to seal the ports, and the jacks are then ready for lifting again. This final stage of lowering is particularly important since it ensures an absolutely even lift by all four jacks on each occasion. It is of interest to note that the outer pair of jacks of the end lifting units are called upon to raise about 14 tons as compared with 8 tons on the inner couple.

A special feature of the lifting jacks is a safety pawl which has been fitted to each jack. Each set of four pawls is controlled by a handle which will be seen at the base of the single jack illustrated. This handle is placed in the " pawls in " position before raising is commenced. When the jacks pick up their load, the pawls automatically engage with the racks so that, when the hydraulic power is cut off, the load carried is supported, not only by the hydraulic force but has additional mechanical security. When it is desired to lower the jacks, the lever is placed in the " pawls out " position. Thus all pawls are immediately disengaged from the racks and the jacks permitted to return without contact with any of the pawl fittings.

The control gear for each lifting unit consists of two operating levers, one of which admits pressure oil to the displacing unit or cuts it off. The other lever has three positions: (1) Raise; (2) Lower with load; (3) lower without load. The total hydraulic lift is 2 ft. 10 in. When the lever is placed in position (2), the jacks are closed partially by the load which is carried. When the body comes to rest on the parts to which it is to be fitted, the lever is placed in the third position. This actuates the retrieving cylinder, and the jacks are finally closed by hydraulic power.



One of the Lifting Units showing motor, pump, displacer and control-gear.

The Jack.

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The overall length of the installation is 140 ft. The distance between each pair of jacks is approximately 36 ft. The width between them is 7 ft. 10 in. In all, 890 ft. of piping is used in connecting up the various jacks. The whole of the pipe line is cold drawn, weldless steel tube and has been tested to a pressure of 15,000 lbs. to the square inch. This is greatly in excess of the actual pressure which is employed when the set is lifting a full load.

The greatest care has been taken to make the apparatus entirely fool-proof. No less than three safety devices have been incorporated in the system to relieve any excess of pressure that might at any time be generated. The controls may be placed in " power on " position and the jacks lifted to their utmost height

Control Gear for the three units.

and the pumps may be left working yet no damage can be done to the system as the whole of the surplus fluid is by-passed. A device has been included to regulate the amount of lift. The jacks are capable of giving a 3-ft. lift. An adjustable operating valve has been provided which enables the lift to be limited at one, two or three feet if desired. The whole system has been designed and manufactured with an ample margin of safety so that there is no liability to danger from mistakes.

The field of utility for hydraulic apparatus is rapidly widening and Henry Miller & Company are to be congratulated on the successful application of their system to this use.

## REGENERATIVE CONTROL FOR TRAMCARS.

In reporting to the Council of the Municipal Tramways and Transport Association upon the visit of the British delegation to Paris to witness a demonstration of regenerative control as applied to tramcars, the President suggested that experiments should be conducted by the Association. The following were appointed a committee to consider the question of collective investigation and experiments: Mr. R. Stuart Pilcher (President), Alderman A. G. Ellaway (Vice-President), Mr. A. C. Baker, Birmingham; Mr. J. M. Calder, Reading; Mr. John F. Cameron, Northampton; Mr. H. Gerrard, Glasgow; Mr. P. Priestly, Liverpool; and Mr. C. Owen Silvers, Wolverhampton.

## BOOSTER BRAKE SHOE DEMONSTRATION.

WESTINGHOUSE DEVICE WHICH PERMITS THE USE OF MORE POWERFUL AIR-BRAKE EQUIPMENT.

One of the objectives toward which designers of electric railway equipment have been directing their inventive ability has been the provision of quicker and smoother braking. Of interest, in this connection, is the new brake booster recently demonstrated in Pittsburg by the Westinghouse Traction Brake Company. The apparatus, which combines features of the ordinary air brake and of the magnetic brake, was installed on a standard type truck of the Pittsburg Railways for demonstration purposes. The booster is described in the journal of the American Electric Railway Association, as consisting of two magnets on each truck, spring-suspended at a point about ⅝ in. above the rail. When a brake cylinder pressure of approximately 45 lb. was applied, a pneumatically-operated switch was closed, which energised the coils on the booster shoe, causing them to move towards the rail.

The shoe does not, however, touch the rail, as in the case of a magnetic brake. The effect of the magnetic pull is the same as though weight was actually added to the car. Thus the adhesion between the wheel and the rail is increased, permitting more powerful braking which, in turn, makes possible a quicker stop.

The magnetic attraction does not itself produce any braking effect. It merely makes possible the use of more powerful air-brake equipment on a car of given weight by increasing the point at which an application of air would cause the wheels to lock and slide. On the demonstration car, which weighed approximately 44,000 lb., the magnetic effect on each truck amounted to about 6,000 lb., or a total of 12,000 lb. for the car, representing an additional adhesion between wheel and rail of 28 per cent. In the tests, stops were made at retardations of 4 M.P.H.P.S. without the booster and at 8 M.P.H.P.S. with it, showing the possibility of stopping a car in one-half the distance required with the usual air-brake equipment.

At the lower rate of speed, a braking ratio of about 138 per cent was used, compared with a braking ratio of 275 per cent at 8 M.P.H.P.S. based on the actual car weight of 44,000 lb. and was approximately 215 per cent, based upon the effective weight of 56,000 lb. as produced by the operation of the traction booster. The apparatus was purely for experimental purposes and does not represent, as yet, a practical commercial design.

A further report of the demonstration has been given by *Electric Traction* (Chicago), in which emphasis is placed on the efficiency of the traction booster. Stops were made in two groups at retardations of 4 M.P.H. and 8 M.P.H.P.S. respectively. Those at 4 M.P.H.P.S. were intended to show what can be accomplished through present standard air-brake devices, with some consideration for the ability of the truck and the car-body members to withstand the forces employed. For this purpose a braking ratio of approximately 138 per cent was used.

The stops accomplished at a retardation rate of 8 M.P.H.P.S. required the assistance of the traction booster, which through a magnet pull between the truck and the rail served to increase the adhesion between the wheels and the rail by 28 per cent. This represents an additional pull of 6,000 lb. per truck, of

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12,000 lb. per car, as used in this demonstration, the car complete weighing 44,000 lb. The braking ratio of 275 per cent based on the car weight, and with the assistance of the traction booster, adding 12,000 lb. to the weight, the effective braking ratio was approximately 215 per cent. The practical use of the braking ratio of 215 per cent was possible because of the fact that the rails were sanded and a retardation controller was employed to reduce the peak of retards which occurs at the instant of stopping.

The retardation controller consists of a cylindrical weight moving freely between rollers in a tightly-sealed case, but held in balance or neutral position by opposing springs at each end. If the retardation exceeds a pre-determined value, the weight moves, and in doing so opens a valve which in turn reduces brake cylinder pressure. The friction characteristics of cast-iron brake shoes are such that unusually high friction occurs at very low speeds, such as at the instant of stopping. This causes a surge or jerk in the car, and, in view of the unusually high forces employed, would be objectionable unless controlled in a manner as indicated.

Magnets were suspended in their release or inactive position at a point approximately ⅝ in. above the rail. When a brake cylinder pressure of approximately 45 lb. was obtained, a pneumatically-operated switch was closed, which energised the coils on the shoe and caused them to move toward the rail. The shoe does not, however, actually come in contact with the rail, because such a form of equipment has introduced difficulties of maintenance and upkeep. The magnetic attraction caused by the operation just described serves to increase the load between the wheel and the rail, without actually increasing the weight of the car and its passenger load.

The magnetic attraction, of course, does not in itself produce any retardation, and for that reason its effect could be employed either in service or emergency stops, leaving it to the car operator to manipulate his brake valve according to the results desired. To this extent it might, in fact, be considered an additional assurance against wheel sliding under bad rail conditions. A standard Westinghouse M-33 self-lapping brake-valve was employed in the demonstration.

## G. D. PETERS (INDIA), LTD.

A branch company, with the title of G. D. Peters (India), Ltd., and a staff of technical specialists and salesmen and offices at Bombay and Calcutta, has been established in India by Messrs. G. D. Peters & Co., Ltd., and associated companies. Founded in 1869, G. D. Peters & Co., Ltd., have been pioneers in the development of supplies and equipment for rolling-stock. Later, in association with the Consolidated Brake & Engineering Co., Ltd., and the British Power Railway Signal Co., Ltd., they have been responsible for the introduction of a large number of improved appliances and fittings which contribute materially to the safety, comfort, and convenience of the travelling public. At the extensive and well-equipped works of the G. D. Peters group at Slough are manufactured the C.B.E. vacuum brake equipment and B.P. power signalling apparatus of international repute, with which engineers and officials of the Indian railway administrations are already familiar. There also are produced the pneumatic door operating and control apparatus now recognised as an invaluable aid in handling suburban passenger traffic by rail or road, the plastic arc welding plant and electrodes, without which no modern factory or workshop is complete, besides a miscellany of fittings and furnishings required in the construction of rolling-stock for railways, tramways, and omnibuses. The object of G. D. Peters (India), Ltd., will be to place at the disposal of customers in India the store of technical knowledge and experience accumulated by the group of companies in their respective spheres of activity, and to maintain the reputation for highest grade design, quality, and workmanship.

## LONDON PASSENGER TRANSPORT.

THE GOVERNMENT BILL.

Particulars have been advertised of the London Passenger Transport Bill, which is to be presented to Parliament by Mr. Herbert Morrison, the Minister of Transport, in the beginning of the New Year. The notice elaborates certain proposals of the Government as previously outlined by Mr. Morrison and published in our issue of October 4.

The Bill will provide for the creation of a Transport Board for the London Traffic Area. It is proposed to transfer to this Board the London County Council Tramways, all the undertakings of the London Underground Group, including the Metropolitan Tramways, the London United Tramways, the South Metropolitan Tramways, the Union Construction & Finance Co., the London General Omnibus Co. and its auxiliaries, and all the other omnibus companies in the London Traffic Area as defined in the London Traffic Act, 1924. A list of these companies is given in the notice. The Board will also acquire the transport undertakings owned or operated by the local authorities of Barking, Bexley, Croydon, the City of London, Dartford, East Ham, Erith, Ilford, Leyton, Walthamstow and West Ham, and by the County Councils of Hertfordshire and Middlesex. Under the Bill it is proposed that any local authority adjacent to the area may enter into agreement for the Board to operate its service within that area.

The Board would have the duty of managing, maintaining, carrying on, co-ordinating, improving and extending the existing undertakings, and would be empowered to operate public service vehicles, both within and without the London Traffic Area, to manufacture rolling stock, vehicles and appliances, and to dispose of any of the undertakings.

Provision is made for the payment of compensation to any body, or individual in respect of loss caused by the prohibition or curtailment of existing services, also for compensation to be paid to employees who may suffer pecuniary loss owing to the transfer of undertakings.

The Board would be empowered to issue stock, and various financial provisions in connection with the transfer are enumerated.

The suburban traffic of the main line railways does not come within the scope of the proposals, but there is provision for co-ordinating the working of the undertakings of the Board with those of the railways, and for levying, fixing and pooling the fares and charges.

Power will be sought to fix, increase or reduce fares, and the Minister of Transport will be empowered to require the Board to provide new or improved transport facilities. Any question relating to fares and charges for passengers on the Metropolitan Railway will be excluded from the jurisdiction of the Railway Rates Tribunal.

The Board would have the right to prohibit or restrict the running within the London Traffic Area of any public service vehicle which on any one journey both takes up and sets down any one passenger within the area. The Board would be exempt from the provisions of Part II of the Road Traffic Act, and that section of Part IV relating to road service licences.

It is also proposed to transfer to the Board the right to run steamboats on the River Thames which was obtained by the London County Council in 1904.

## DIESEL LOCOMOTIVES FOR SOUTH AMERICA.

AN "ENGLISH ELECTRIC" CONTRACT.

An order received by the English Electric Co. from the Buenos Aires Great Southern Railway is specially interesting, as it deals with Diesel electric traction. The new rolling stock for the railway will include three eight-coach trains, each train having attached to it a self-propelling Diesel electric power-house. For these trains the English Electric Co. will supply 62 motors, each of 135 H.P., and control equipment. Two motors will be mounted on each of the outer bogies of the power-houses, and each motor coach will be driven by two motors, leaving two motors spare.

The English Electric Co. are also supplying six motors and control equipments for a 1,700 H.P. high-speed Diesel electric locomotive, which is under construction. The main contractors for the rolling stock are Messrs. Armstrong, Whitworth & Co., who will also supply the Diesel locomotive.

HOURS OF WORK INCREASED AT BRISBANE.—In accordance with a decision of the Industrial Court the hours of work of Brisbane tramway employees have been increased from 44 to 48 per week. Hourly rates of pay are to be slightly reduced. In order to avoid dismissals the motormen and conductors have agreed to stand down without pay one week in eleven.

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## LUNCHEON TO MR. W. CHAMBERLAIN.

On Friday, December 12, an informal luncheon was given by the Municipal Tramways and Transport Association at the Arundel Hotel, London, to Mr. W. Chamberlain to congratulate him on his appointment as Traffic Commissioner for the North-West England area. Mr. R. S. Pilcher, President, presided, and in proposing the toast of "Our Guest, Mr. W. Chamberlain," said the announcement of Mr. Chamberlain's appointment had been received in the municipal transport industry with mixed feelings. They were exceedingly sorry he was leaving the industry and the Association, but at the same time they were all glad to know he was taking up such a high position, which was not only an honour to himself, but to the Association. Mr. Chamberlain had had a very strenuous time in Belfast; the difficulties there could not have been less than those in Glasgow, but in changing to his new sphere, Mr. Chamberlain would be faced with other difficulties of a different character, perhaps, but more far-reaching in their effects when they had been solved. It was the fact that a great deal of the policy which Mr. Chamberlain had enunciated during the time he was President, and in his evidence before the Royal Commission, was reflected in the Road Traffic Act. The work the Commissioners would be called upon to do, however, needed strong men who would not flinch at adopting a policy which might mean hardship to somebody. The conditions in the transport

Mr. W. Chamberlain.

world to-day were such that in certain instances there was no room for compromise, and the decision of the Commissioners in the public interest must mean hardship for somebody. Those who knew Mr. Chamberlain had no fear but that he would act with strict justice, irrespective of whether the interests concerned were municipal or company. The municipal transport undertakings did not desire, and had never asked for, favours. Indeed Mr. Chamberlain himself, when acting as spokesman of the municipal transport undertakings, had made that point very strongly, and municipal operators would do well not to expect favours from Mr. Chamberlain, because they would not get preference in any shape or form.

Mr. Chamberlain, in reply, expressed his sincere thanks for the kindly thought that had prompted giving this luncheon to him. He expressed appreciation of the manner in which he had always been received in the transport industry, and went on to say that the Road Traffic Act called for careful handling. Although there might be, to practical transport men, certain irritating formalities, he knew they were all big enough to brush that sort of thing on one side, and view the effect of the operation of the Act as a whole. Very extensive powers were given to the Commissioners, but he was sure that any attempt to govern such an important industry as the transport industry by anything in the nature of dictation would be a failure. It could only be done by the heartiest co-operation of all. The Commissioners had been put into their positions to assist and advise, where they were qualified to advise, but they were also there to take advice and to work whole heartedly with everybody concerned. He concluded with a reference to the happy time he had had in Belfast, which, he said, he was only leaving because he felt he could, in his new position, give effect to his ideals in a way he could not in Belfast.

Mr. C. J. Spencer (General Manager, London United Tramways, Ltd.) proposed the toast of "The Chairman."

The following, of whom many spoke expressing their congratulations to Mr. Chamberlain, were also present:—Mr. A. C. Baker, General Manager, Birmingham Corporation Tramways and Motor Omnibus Department; Mr. J. Beckett, General Secretary, Municipal Tramways and Transport Association; Alderman James Bowes, J.P., of Manchester; Councillor I. Brassington, Chairman, Manchester Transport Committee; Mr. Frank Buckley, Manager and Engineer, Norwich Electric Tramway Co., Ltd.; Mr. J. M. Calder, General Manager, Reading Corporation Tramways; Mr. John F. Cameron, General Manager, Northampton Corporation Tramways; Alderman T. Canby, J.P., Chairman, Huddersfield Tramways Committee; Mr. A. Chadwick, Assistant Secretary, M. T. and T. Association; Alderman H. Clark, Chairman, Rochdale Tramways Committee; Alderman A. G. Ellaway, J.P., Vice-President, Municipal Tramways and Transport Association, and Vice-Chairman, Birmingham Tramways Committee; Mr. A. R. Fearnley, General Manager, Sheffield Corporation Tramways; Mr. W. Forbes, General Manager, Cardiff Corporation Tramways; Mr. Charles Furness, General Manager, Blackpool Corporation Tramways; Mr. T. B. Goodyer, late General Manager, Croydon Corporation Tramways; Alderman W. Greenwood, J.P., Chairman, Salford Tramways Committee; Mr. L. E. Harvey, General Manager, Ilford Corporation Tramways; Alderman Geo. Hill, J.P., Chairman, Burton-on-Trent Transport Committee; Mr. C. Jackson, General Manager, Plymouth Corporation Transport; Mr. L. Mackinnon, J.P., General Manager, Glasgow Corporation Transport; Alderman Richard Mayne, J.P., Chairman, Newcastle Transport Committee; Mr. Percy Priestly, General Manager, Liverpool Corporation Tramways; Mr. T. C. E. Rowlands, Chief Engineer, Birmingham Corporation Tramways and Motor Omnibus Department; Mr. T. E. Thomas, General Manager, London County Council Tramways; Alderman Sir John Timpson, K.B.E., J.P., Chairman, Portsmouth Tramways Committee; Mr. George Webster, General Manager, Rochdale Corporation Tramways.

## THE NEW GENERAL MANAGER AT BRADFORD.

The Corporation Tramways Committee on December 13 appointed Mr. C. R. Tattam general manager of the undertaking. Mr. Tattam is the manager of the Balfour-Beatty group of transport undertakings in England and Wales. There were 38 applications for the vacancy caused by the resignation of Mr. R. H. Wilkinson through ill-health. It will be remembered that the Committee two months ago sought advice as to future policy from Mr. C. J. Spencer, general manager of the tramways of the London Underground Group, and formerly general manager at Bradford. Mr. Spencer's report is now in the hands of the Committee. Mr. Tattam, who is forty-five years of age, is a native of Middlesex and received his preliminary training in engineering at Tonbridge School. Since 1912 he has been manager of the Balfour-Beatty group, which comprises nine tramway and omnibus undertakings.

## A TWENTY-FIRST ANNIVERSARY.

The Equipment and Engineering Co., Ltd., 2 and 3, Norfolk Street, Strand, London, W.C.2, have issued two attractive booklets as a souvenir of their twenty-first anniversary. All who are interested in ancient London will read with appreciation a well-printed 30-page souvenir by E. P. Leigh-Bennett on "Ghosts Grave and Gay." The author passes in review, from the Roman era to the present day, incidents associated with the thoroughfare that linked the city's western gate with the village of Charing. The second publication gives some idea of the part which the Equipment and Engineering Co. has played in enabling public passenger undertakings to function with the maximum efficiency by means of the hundred and one mechanical aids provided for operation and maintenance, not only in Great Britain but abroad. Over 90 per cent. of the company's products are of entirely British design and manufacture. Copies of these booklets will be sent by the company to any of their friends in the transport industries.

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## CHAIRMEN OF MUNICIPAL TRANSPORT COMMITTEES.

The following is a list of the chairmen and vice-chairmen of Tramway and Omnibus Committees for the current year. New appointments are indicated by an asterisk.

| Town | Chairman | Vice-Chairman |
|---|---|---|
| Aberdare | Coun. Glen. George | — |
| Aberdeen | Coun. J. George | — |
| Accrington | *Ald. Ellis | Coun. J. Laytham |
| Ashton-under-Lyne | Coun. C. M. Bowden | *Coun. Fish |
| Ayr | Bailie C. C. Hutchison | Coun. H. Paterson |
| Barrow | Coun. W. A. Pickthall | Coun. R. Harper |
| Batley | Ald. J. W. Schofield | Coun. C. R. Spedding |
| Belfast | Coun. J. D. McClure | Coun. R. J. R. Harcourt |
| Bexley | *Coun. A. J. Franklin | — |
| Birkenhead | Ald. S. Vaughan | Ald. W. H. Egan |
| Birmingham | Ald. A. H. James, C.B.E. | Ald. A. G. Ellaway |
| Blackburn | Ald. G. Burke | Coun. J. Charnley |
| Blackpool | Ald. T. G. Lumb | *Coun. C. E. Tatham |
| Bolton | Coun. W. Bradley | Ald. R. Heywood |
| Bournemouth | *Ald. F. B. Summerbee | *Coun. Mapp |
| Bradford | *Coun. W. Hodgson | *Coun. Carter |
| Brighton | Coun. C. G. Yates | — |
| Burnley | Ald. L. Thornber | Coun. J. W. Gradwell |
| Burton-on-Trent | Ald. G. Hill | *Coun. F. O. N. Hurdle |
| Bury | Coun. W. E. Turner | *Coun. Riddel |
| Cardiff | Coun. H. Johns | Coun. W. H. Parker |
| Chester | Ald. A. S. Dutton | Coun. W. H. Ebrey |
| Chesterfield | Coun. P. M. Robinson | Ald. H. Cropper |
| Colchester | *Coun. A. W. Piper | *Coun. P. A. Sanders |
| Colne | Coun. E. Tye | — |
| Coventry | Coun. O. M. Flinn | Coun. J. A. Moseley |
| Crompton | *Coun. J. Hall | *Coun. F. Leach |
| Croydon | Coun. H. Keys | Coun. A. J. Carpenter |
| Darlington | Ald. Sir C. Starmer | — |
| Darwen | Coun. E. Leach | Ald. G. Pickup |
| Dearne Dist. | Coun. M. L. Nokes | Coun. G. Probert |
| Derby | Ald. W. H. Salisbury | Ald. A. Sturgess |
| Doncaster | Ald. H. M. Marshall | Coun. W. Corbett |
| Douglas | *Coun. J. H. Skillicorn | — |
| Dover | Ald. R. J. Barwick | Coun. G. M. Norman |
| Dundee | Coun. R. A. Scrymgeour | — |
| Eastbourne | Coun. J. MacLachlan | Coun. Taylor |
| East Ham | *Coun. J. W. Barton | *Coun. Thompson |
| Edinburgh | *Coun. Adam Miller | — |
| Erith | Coun. G. C. Humphreys | — |
| Exeter | *Coun. H. E. Bradley | *Ald. P. Gayton |
| Glasgow | Coun. P. J. Dollan | *Bailie J. McSkimming |
| Gloucester | Ald. C. E. Gardner | *Coun. W. H. S. Colborn |
| Great Yarmouth | Coun. E. V. Barr | Coun. F. Base |
| Grimsby | Coun. E. Harrison | Coun. C. W. Hewson |
| Halifax | Coun. A. H. Gledhill | Ald. R. Stirk |
| Haslingden | Coun. W. H. Baxter | Coun. R. Bowker |
| Heywood | Ald. Healey, | Coun. T. Greenhalgh. |
| Huddersfield | Ald. T. Canby | Ald. T. Woffenden |
| Hull | *Ald. J. G. Hewett | Ald. R. W. Wheeldon |
| Ilford | Ald. G. R. Davey | Coun. J. H. Shipman |
| Ipswich | Coun. S. C. Grimwade | Coun. F. W. Turner |
| Keighley | Ald. A. Smith | Coun. J. S. Binns |
| Kilmarnock | Bailie J. Bryce | — |
| Kirkcaldy | Coun. A. Hutchison | *Provost Kilgour |
| Lancaster | Ald. I. J. Curwen | — |
| Leeds | *Ald. Graham Ford | *Ald. A. J. Dobbs |
| Leicester | Ald. G. Banton | Coun. W. K. Billings |
| Leigh | Ald. T. Grundy | Ald. W. Hilton |
| Lincoln | Coun. J. K. Fox | — |
| Liverpool | Coun. F. C. Wilson | Ald. P. J. Kelly |
| London County Council | *F. Bertram Galer | *E. H. Kemp |
| Lowestoft | Coun. A. Evans | Ald. S. W. Humphery |
| Luton | Coun. C. C. Dillingham | Coun. P. W. Currant |
| Lytham St. Annes | Coun. C. D. Sharman | Coun. J. W. Simister |
| Maidstone | Coun. T. Armstrong | Coun. G. Larking |
| Manchester | Coun. I. Brassington | Coun. J. S. Hill |
| Merthyr Tydvil | Coun. J. Williams | — |
| Middlesbrough | Coun. J. Hamill | — |
| Morecambe | Coun. M. Benson | Coun. E. Stansfield |
| Nelson | Ald. C. Smithson | Coun. W. O. Pugh |
| Newcastle-upon-Tyne | Ald. R. Mayne | Coun. A. Oates |
| Newport (Mon.) | Coun. F. W. Raikes | Ald. F. Phillips |
| Northampton | Coun. A. W. Lyne | Coun. J. Peach |
| Nottingham | Ald. A. Turney | Coun. J. Farr |
| Oldham | Coun. I. Crabtree | Ald. F. Tweedale |
| Perth | Coun. Col. H. Dalton Henderson | — |
| Plymouth | *Coun. L. R. Dunstan | *Coun. F. D. Baxter |
| Pontypridd | Coun. D. L. Davies | — |
| Portsmouth | Ald. Sir J. Timpson K.B.E. | Coun. A. E. Hooper |
| Preston | Ald J. Woolley | — |
| Prestwich | Coun. T. Spencer | *Coun. F. Read |
| Radcliffe | Coun. J. H. Lund | — |
| Ramsbottom | Coun. A. E. Pape | — |
| Rawtenstall | *Coun. R. Ashworth | *Coun. C. Kenyon |
| Reading | Ald. C. G. Field | *Coun. Bale |
| Rochdale | Ald. H. Clark | — |
| Rotherham | Ald. G. E. Caine | Coun. A. Buxton |
| St. Helens | Ald. A. Rudd | Coun. R. Waring |
| Salford | Ald. W. Greenwood | Coun. E. A. Hardy |
| Sheffield | Ald. A. J. Bailey | Coun. T. Garnett |
| Shipley | *Coun. A. E. Horne | *Coun. C. M. Smith |
| Southampton | Ald. P. V. Bowyer | — |
| Southend | Coun. W. J. Perrett | — |
| Southport | Coun. J. Billington | *Coun. T. Ball |
| South Shields | Coun. C. A. Henderson | Ald. R. Vine |
| Stalybridge, etc., Tramways Board | Ald. R. Wood | Ald. J. Westbrook |
| Stockport | Coun. T. E. Hunt | *Coun. T. S. Fish |
| Stockton and Thornaby Joint | Ald. R. M. Elliott | — |
| Sunderland | Ald. R. Dixon Jeffrey | Coun. J. Wilson |
| Swindon | Ald. W. R. Robins | Coun. A. R. Smith |
| Teeside Railless Traction Board | Coun. P. McPartlan | — |
| Todmorden | Coun. J. W. Whitaker | — |
| Wallasey | Coun. S. Panter-Brick | Coun. W. H. Griffiths |
| Walsall | Coun. W. D. Forsyth | Ald. J. Thickett |
| Walthamstow | Ald. H. Frost | — |
| Warrington | Ald. Sir P. Peacock | Ald. G. Archer |
| West Bromwich | *Ald. T. Cottrell | *Coun. Adams |
| West Ham | *Coun. J. Doherty | — |
| West Hartlepool | *Coun. G. Ropner | *Coun. J. G. Morgan |
| Wigan | *Coun. E. Ball | Coun. D. Rourke |
| Wolverhampton | Coun. A. Davies | Coun. M. Christopher |
| York | *Coun. J. W. Dow | *Coun. R. Rowland |

## DEATH OF MR. EMILE GARCKE.

It is with deep regret that we record the sudden death, following pneumonia, on November 14, of Mr. Emile Garcke, at his residence, Ditton Meads, Berkshire, at the age of 74. Mr. Garcke came to England from Germany when a youth, becoming naturalised at the age of 24. In 1883 he was appointed secretary of the Brush Electrical Engineering Co., and ten years later he was elected chairman and managing director. In this capacity he was able to introduce co-partnership with the employees. A year ago, on giving up some of his public activities, he accepted the presidency of the Industrial Co-Partnership Association. It is to Mr. Garcke's generosity that the Association owes its new headquarters in Gordon-square. In 1893, Mr. Garcke, on becoming managing director of the Electric Construction Co., reorganised the company, which carried out many important enterprises. The formation by him in 1895 of the British Electric Traction Co., of which he became managing director, led to a great development of electric tramways, together with electricity supply. Another organisation established by Mr. Garcke was the Electric and General Investment Co. In later years, the B.E.T., as it was familiarly termed, also interested itself in motor omnibus operation, this development being known as the British Automobile Traction Co. Mr. Garcke obtained, at his own cost, the initial powers of the County of London Electric Supply Co., and for twenty years was chairman of the North Metropolitan Electric Supply Co. During recent years he served on the Advisory Joint Electrical Committee. He founded the Electrical Section of the London Chamber of Commerce, and was a vice-president of the Tramways, Light Railways and Transport Association. "Garcke's Manual of Electrical Undertakings" is a monument to his memory. Last year he published a book on philosophy, which was reviewed in this journal. He was one of the founders and hon. treasurer of the British Institute of Philosophy. His widow and son, Mr. Sydney E. Garcke, have received a great number of letters of condolence. Mr. Sydney Garcke is chairman of Tillings and British Automobile Traction Ltd.

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# TRAMWAY AND LIGHT RAILWAY NOTES.

## ACCRINGTON.

TRAMWAY ROUTES TO BE ABANDONED.

The Ministry of Transport has sanctioned the abandonment of the Baxenden tramway route, approximately 2.5 miles. The abandonment of other sections is contemplated, but the Corporation has not yet made application regarding any of these.

## BIRKENHEAD.

TRAMCARS IN LOOP LINE.

A motorist summoned at Birkenhead for driving dangerously was stated to have driven his car on the pavement because two tramcars were drawn up on a loop line. He stated to a police witness that the cars were an obstruction, and he thought it was all right to pass. The defending solicitor said the cars took up most of the road and obstructed traffic. The magistrates dismissed the case.

## BRADFORD.

TRAMWAYS REORGANISATION—BRIGHTER CARS.

The first instalment of a long report prepared by Mr. C. J. Spencer, general manager of the tramways of the London Underground group, who was formerly manager of the Bradford Corporation Tramways, has been received by the Tramways Committee. His advice, it will be remembered, was sought by the Committee on the resignation of Mr. R. H. Wilkinson through ill-health. Mr. Walter Hodgson, chairman of the Committee, has stated that the report will be made public when complete. It is stated that one of the main changes of policy recommended is the substitution of long distance trolleybus lines for tramways, as was recommended by the late general manager, and for which purpose powers were obtained last session. The cost of the tramcars per car-mile is said to be 1s. 6½d., whereas that of the trolleybus is given as slightly over 1s. 2d., nearly ½d. per mile less than petrol omnibuses. The chief aim of the Committee is to effect economy in administration. About 100 employees have already been dismissed, and salary cuts and service restrictions are probable. There is likely, it is reported, to be some difficulty in avoiding a call on the rates in the coming year. Flood lighting is being introduced on the tramcars, with the object of making travel conditions more comfortable for readers. Three cars with the new lighting installation are now in service, and others are to follow.

## DUBLIN.

TRAMCARS ON SHANNON POWER—SAFETY ZONES FOR PASSENGERS.

The Dublin United tramway system is now being run entirely on current supplied from the Shannon electricity supply. It is understood that the company will pay the Electricity Board the same price as that at which the company generated their own power, one halfpenny per unit. The company's generating station has been closed, and it may be converted into an omnibus depot. It is proposed to institute safety zones on the carriage-ways at the principal tramway stops. Intending passengers will be able to stand in the roadway within the area of the zones, which will be prohibited to other traffic.

## DUNDEE.

PROPOSED PURCHASE OF DISTRICT TRAMWAYS.

Negotiations between Dundee Corporation and the Dundee, Broughty Ferry and District Tramways Co., for the purchase of the Company's undertaking, or an arrangement for operating the cars and omnibuses, are stated to be progressing favourably.

## GLASGOW.

BOW COLLECTOR TO BE ADOPTED.

All the Glasgow tramcars are to be equipped with the Fischer bow collector at a cost of £20,000. It has been used experimentally for the past five years, and is already in use on 130 cars. The results have been smoother running and greater safety on curves, and generally the operation is more satisfactory than with the trolley arm and wheel. The bow does not leave the wire, the cars are never in darkness at turning points, there is no whistling from the trolley wheel, and no sparking from the bow. The bow collector has been largely used in Birmingham, but it is claimed that Glasgow is the first to adopt the bow throughout the entire tramways. Approval has been given by the Town Council to the purchase of the patent rights, so that the Corporation may construct the apparatus at their Coplawhill works. Councillor P. J. Dollan, convener of the Committee, has stated that the price was not disclosed, because the department were getting special consideration. The patent rights applied only to the Corporation's service.

## LEEDS.

FREE PASSES WITHDRAWN.

The City Council on December 3 decided by a large majority to rescind the resolution passed when the Labour Party was in power authorising the issue of free tramcar passes to the members of the Council.

## LONDON.

NEW CARS FOR WALTHAMSTOW—LINK-UP PROPOSALS—NEW L.C.C. AND AUTOMATIC STOP LIGHTS. AN EXTRA FARE ABOLISHED—ELEPHANT AND CASTLE TRACK.

Walthamstow Council has decided to purchase additional tramcars at a cost of £19,556. The scheme for linking up the tramways of Walthamstow Corporation and the Metropolitan Electric Tramways between Ferry Lane and Tottenham High Road by the Hale and High Cross Road, has been approved. The Metropolitan Electric Tramways are being urged by Alexandra Park Trustees, through the Middlesex County Council, to consider immediately linking up the Hornsey and Wood Green routes. Replying to a question at the meeting of the L.C.C. on December 2, Mr. F. Bertram Galer, chairman of the Highways Committeee, said they had considered fitting the cars with an automatic device so that traffic behind might have due warning, but no reliable device was yet available. The L.C.C. have made an arrangement with the Metropolitan Electric Tramways, whereby the payment of extra fare for traversing Amhurst Park is abolished. The track in London-road, Elephant and Castle, s scheduled to be renewed in the spring.

## NEWCASTLE.

ECONOMY ON THE TRAMWAYS.

The Transport Committee has appointed a sub-committee to consider a rearrangement of the tramway services in the Heaton area. By re-routing certain cars, it is suggested that a reduction could be effected in the number in service. The Committee may later undertake an investigation of all the services in the city in an effort to secure the use of fewer cars without any decrease in efficiency. It is estimated that for every car withdrawn operating expenses would be reduced by £1,000 a year. Optimists on the sub-committee are hopeful of effecting a reduction of £10,000. Notable economies were effected in operation in the year ended March last. Calculated on a mileage basis, the reduction amounts to nearly £15,000 on the preceding year. An appeal is being made to the public for co-operation in quicker loading and unloading.

## NOTTINGHAM.

PASSING STATIONARY TRAMCARS.

The town clerk, Mr. W. J. Board, has replied to a correspondent stating that the Corporation has no power to make a by-law preventing motor vehicles from passing stationary tramcars. The Bill promoted by the Corporation in 1929 contained a clause giving that power, but it was strongly opposed. As Parliament had struck out similar clauses in other Corporation's Bills, and there was a probability that the whole Bill would be blocked on second reading, and its passing jeopardised, the clause was reluctantly withdrawn. Glasgow obtained power to make such a by-law by an Act of 1912, and other Scottish towns have similar powers.

## SHEFFIELD.

CHRISTMAS DAY SERVICE—TOWN CLERK ON TRAMWAYS.

The City Council decided by a large majority to run a skeleton service of tramcars and omnibuses on Christmas Day. In a paper prepared by Sir William Hart, town clerk of Sheffield, and read by a substitute at a meeting of Sheffield Historical Association, it was stated that tramways were going through a period of transition. Some less informed persons considered that before long tramways would become obsolete. This was not the opinion of those best qualified to judge. It was their opinion that tramways had an important future.

## STOCKTON.

DISPLACED TRAMWAY EMPLOYEES.

Tramway employees who are displaced by the change over to omnibuses which will take place in the next two years are to be transferred as far as possible to the omnibuses. The chairman of the Omnibus Committee, Ald. E. Pickworth, has stated that those not taken over will be found work in other departments. Tramcar drivers are being trained as omnibus drivers.

## SUNDERLAND.

PROPOSED TRAMWAY EXTENSION.—BOW COLLECTOR ADOPTED.

A joint meeting of the Tramways and Highways Committee is to discuss a proposal to extend the tramway service to the borough boundary at Seaburn. The cost is estimated at £8,000. After experimental running of a car equipped with the Fischer type of bow collector, the Tramways Department, acting on the advice of the manager, has decided to install the bow collector on all its cars.

## WIGAN.

TRAMWAY ROUTE CLOSED.

The Ashton-in-Makerfield route of Wigan Corporation Tramways was closed on December 1 and a service of Leyland double-deck "Titan" omnibuses substituted. Other routes will also be changed over.

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## PERSONAL.

**Alderman R. Mell,** chairman of the Tramways Committee, has been elected Lord Mayor of Hull.

**Alderman A. H. James** has been reappointed chairman of Birmingham Tramways and Omnibus Committee.

**Sir William Letts** has resigned from the board of the Fisk Tyre Co., Ltd., both as chairman and director.

**Ald. Salisbury** has been re-elected chairman of Derby Transport Committee, and **Ald. Sturgess** vice-chairman.

**Alderman Graham Ford,** recently vice-chairman, has been appointed chairman of Leeds Transport Committee.

**Mr. J. Coulon,** traffic manager of the Western Welsh Omnibus Co., has been transferred to Cardiff headquarters as traffic superintendent.

**Mr. J. Milne, C.S.I.,** general manager of the Great Western Railway, has been elected a member of the council of the Institute of Transport.

**Mr. W. V. Wood,** vice-president of the London, Midland and Scottish Railway, has been appointed honorary librarian of the Institute of Transport.

**Alderman R. J. Barwick** has been re-elected chairman of the Dover Corporation Tramways Committee, and Councillor G. M. Norman, vice-chairman.

**Mr. Sidney E. Garcke** has been elected a director of the Electric and General Investment Co., Ltd., in the place of his father, the late Mr. Emile Garcke.

**Mr. L. R. Lovell Dunstan** has been appointed chairman of Plymouth Tramways and Transport Committee, and **Mr. F. D. Baxter** has been appointed vice-chairman.

**Mr. E. J. Butler, F.R.S., Mr. Kenneth Lee,** and **Mr. N. V. Sidgwick, F.R.S.,** have been appointed members of the Advisory Council to the Department of Industrial Research.

**Mr. James Dalrymple,** former general manager of the Glasgow Corporation Tramways, left at the middle of November for a voyage round the world. He is accompanied by Mrs. Dalrymple.

**Mr. H. W. Swann,** an electrical inspector of the Factory Department, Home Office, has succeeded to the post of senior electrical inspector of factories on the retirement of Mr. G. Scott-Ram.

**Mr. J. Porter,** permanent way foreman in the Manchester Corporation Tramways Department, has retired after fifty years' service. The workmen have presented him with a diamond ring.

**Alderman A. Turney** has been re-elected chairman of Nottingham Corporation Transport Committee and Councillor J. Farr vice-chairman. This is Alderman Turney's third period as chairman.

**Councillor F. C. Wilson** and **Alderman P. J. Kelly** have been re-elected chairman and deputy-chairman, respectively, of the Liverpool Tramways and Electric Power and Lighting Committee.

**Alderman R. Wood** and **Alderman J. Westbrook** have been reappointed chairman and vice-chairman respectively of the Stalybridge, Hyde, Mossley and Dukinfield Tramways and Electricity Board.

**Sir John Timpson, K.B.E.,** has for the third year been unanimously re-elected chairman of the National Joint Industrial Council for the tramway industry, and Mr. John Cliff has been re-elected vice-chairman.

**Mr. P. Armstrong,** district superintendent of the Scottish General Omnibus Co., at Crieff, has been appointed to a similar position at Aberdeen. He is succeeded at Crieff by Mr. Begg, of the Dundee centre of the S.M.T.Co.

**Mr. L. H. Pomeroy,** managing director of the Daimler Co., Ltd., has recovered from his recent illness. It is reported that during his enforced absence from business he thought out several new departures, which are to be turned to practical account.

**Councillor A. Aplin,** the new Mayor of Deptford, was formerly a tramcar conductor, and has been a member of the Council for twelve years. He is the local secretary of the passenger section of the Transport and General Workers' Union.

**Mr. N. V. Everton** has been appointed sales manager of the lamp department of Metropolitan-Vickers Electrical Co., Ltd., with offices at Bush House (West Wing), Aldwych, London, W.C.2, the London headquarters of Metropolitan-Vickers Electrical Co., Ltd.

**Mr. G. Cardwell** has joined the board of London Coastal Coaches, Ltd., as representative of Northern operating firms. Until April last he was general manager of the North-Western Road Car Co., Stockport, but resigned to take up a position with Thomas Tilling, Ltd.

**Mr. G. R. Greenbergh** has been appointed managing director of Pagefield Commercial Vehicles, Ltd., a subsidiary of Walker Bros. (Wigan), Ltd. Earlier in the year, Mr. Greenbergh was given charge of the heavy-oil engined Pagefield vehicle which is a product of the second named company.

**Alderman F. B. Summerbee** has been appointed chairman of Bournemouth Tramways Committee and Councillor E. J. Mapp, vice-chairman. Alderman W. H. Ridout, who has been chairman for eight years, recently intimated his desire not to be re-elected, but will remain a member of the committee.

**Councillor Thorn,** chairman of Leyton Electric Lighting and Tramways Committee, **Alderman Daines,** deputy Mayor, **Alderman Russell** and **Councillor Reynolds** have been appointed to represent the Council on a joint committee with the London County Council to deal with matters affecting the Leyton Tramways.

**Mr. D. P. Dunne,** joint managing director of the Chloride Electrical Storage Co., has lately returned from a visit to America. It is his opinion that depression of trade is probably deeper there than in Britain, but most likely the period would be less protracted, as the Americans were energetic in adopting remedial measures.

**Mr. T. R. Warren** has been appointed technical assistant to Mr. D. Maxwell Buist, engineer for the Central Electricity Board in North-East England. During the past year Mr. Warren has been with the Metropolitan-Vickers Electrical Co., Ltd. He is the holder of numerous patents in connection with automatic frequency control, automatic steam-pressure regulation, automatic synchronising, etc.

**Increases of Salaries at Bexley.**—On the recommendation of the Electricity and Tramways Committee, Bexley Urban Council has voted increases of salary as appended: Mr. A. J. Abraham, general manager and electrical engineer, from £700 to £800, with two annual increments of £25 to £850, Mr. F. A. Buley, assistant electrical engineer, from £325 to £350, subject to his taking over the overhead work.

**Sir John Cadman** and **Mr. Charles J. Hambro** have been appointed directors of the Great Western Railway Co. Sir John Cadman is chairman of the directors of the Anglo-Persian Oil Co., the British Petroleum Co., and the National Oil Refineries, Ltd., a director of the Suez Canal, a member of the Council of the Department of Scientific and Industrial Research, and chairman of the Inter-Allied Petroleum Council.

**Councillor C. A. Henderson,** chairman of South Shields Tramways Committee, has been elected Mayor. He has been a member of the Corporation since 1913, and has been secretary of the Tyne Dock branch of the National Union of Railway Servants for 29 years. For his work during the war he was made an M.B.E., and a year later he was appointed a borough magistrate. He has been a magistrate at Jarrow since 1908.

**Mr. George Balfour,** chairman of Balfour, Beatty and Co., constructional engineers, and Mrs. Balfour, have been presented with Mr. Balfour's portrait in oils to mark the twenty-first anniversary of the firm. Mr. William Shearer, managing director, presided. In making the presentation, Brig.-Gen. A. Maxwell said that the company's success had been brought about by the wisdom and foresight of the original directors, Mr. Balfour and Mr. A. H. Beatty.

**Sir George Humphreys,** chief engineer of the London County Council, was succeeded on December 1 by **Mr. T. Peirson Frank,** city engineer of Liverpool, and permanent way engineer of the Corporation Tramways. The General Purposes Committee of the London County Council has arranged that the services of Sir George shall be retained in connection with the tramways subway from Victoria-Embankment to Southampton Row, and certain other special work in connection with housing and bridges.

**Councillor P. J. Dollan,** convener of Glasgow Transport Committee, has won his appeal in connection with the slander action which was a sequel to alleged graft in the granting of contracts for omnibuses. Sheriff Principal Mackenzie has given judgment in which he stated that it was not a matter of dispute that the statements were false and injurious to the character of the pursuer; the defence was that they were made without malice and on privileged occasions. He found that on one of the occasions, Mr. Rennie's statements were not privileged, and awarded Councillor Dollan £75 damages with expenses.

**Hull Tramways Management.**—Hull City Council on December 4, decided by 43 to 31 to give six months' notice to terminate the engagements of Mr. E. S. Rayner, general manager of the tramways, Mr. B. J. E. Bruce, rolling stock superintendent, and Mr. H. D. Ingram, assistant engineer. At the October meeting a resolution was passed, calling upon the officials to resign, which they refused to do. The Tramways Committee on November 24 decided to defer consideration of the matter for twelve months. The minute containing this decision was submitted to the Council on December 4, and confirmation was moved by Councillor J. G. Hewett, the new chairman of the Committee. Councillor T. Hardaker said in his opinion the manager had never been given an opportunity to manage the tramways, and he thought all the officials should have a twelve months' trial under the new regime. Councillor Hewett urged the Council to give the new Committee a chance to retrieve the position.

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## CONTRACTS AND ORDERS.

**Wednesbury Town Council** has placed an order with the Forest City Electrical Co. for traffic control signals at £311.

**Lincoln Town Council** has placed an order with the Forest City Electrical Co. for automatic traffic signals at £1,129.

**Aberdare Corporation** has placed an order for a rail corrugation remover with the Equipment and Engineering Co., Ltd.

**Durban Tramways Department** have accepted a tender of Messrs. T. Barlow for 100 sets of armature coils at £6 14s. 6d. each.

**Belfast Tramways Committee** has placed an order with the Equipment and Engineering Co., Ltd., for a No. 4 rail-grinder.

**Glasgow Transport Committee** has recommended the acceptance of the tender of Dorman Long & Co., Ltd., for the supply of fish plates.

**Lisbon Electric Tramways** have placed an order for an electro-magnetic crack detector, size B.1, with the Equipment and Engineering Co., Ltd.

**Bradford Tramways Committee** has accepted the tenders of Alfred Wiseman, Ltd., Birmingham, for the supply of twenty-four tramcar gear wheels at £150, and of Brown, Bayley's Steel Works, Ltd., Sheffield, for the supply of twenty steel tramcar axles at £127 10s.

**Gledhill Brook Time Recorders, Ltd.,** of Huddersfield, following a previous order for 138 Gledhill-Brook time recorders, have received a repeat contract for 149 of the same machines for use in Admiralty dockyards. The firm has received an order from the Overseas Trade Department to supply all cash registers that will be required —between 50 and 60—at the British Empire Exhibition to be opened by the Prince of Wales in Buenos Aires next March.

**G.E.C. Tramways Equipment for Auckland.**—Twelve car sets of electrical equipment for the tramways of the Auckland Transport Board have beeu ordered from the General Electric Company, Ltd., Magnet House, Kingsway, W.C.2. Each set consists of four motors, type W.T.28 A.L., each developing 40 B.H.P. at 500 volts on the one-hour rating, one set of resistances, lightning arrester and choke coil. This is the third repeat order from the Auckland Transport Board received by the General Electric Company.

**Liverpool Corporation** has accepted the following tenders on the recommendation of the Tramways Committee: Edgar Allen & Co., Ltd., special tramway trackwork for junction of Water Street and George's Dock Gate, £880; English Electric Co., Ltd., supply of 12 car sets of electro-pneumatic control gear, suitable for multiple-unit working and rheostatic braking, £305 per set; English Electric Co., Ltd., supply of 12 pairs of equal-wheel bogie trucks, with flexible driving shafts, each bogie fitted with one D.K. 120 motor, £1,700 per pair.

**The Central Electricity Board** has placed the following contracts in connection with the North-East scheme of electrical development: A. Reyrolle & Co., switchgear, £53,000; 3,300 volt, 66,000 volt, and 132,000 volt overhead transmission lines, J. L. Eve Construction Co., British Insulated and Helsby Cable Co., British Electrical Transformer Co., and Ferranti, Ltd. The total of the orders is £440,000, bringing the value of contracts already placed for the North-East scheme to over £2,000,000. The first lines to be erected will be those from Sunderland to South Shields and from the North Tees power station to Darlington. These will be completed within the next year, and South Shields and Darlington Corporations will get their supplies from them.

**The English Electric Co., Ltd.,** have an important order in connection with the Lanarkshire hydro-electric scheme, covering the conversion from 25 cycles to 50 cycles of the main generating units at Bonnington and Stonebyres Power Stations. It will be remembered that these water-turbine alternator sets, including two of 7,000 H.P. at Bonnington and two of 4,000 at Stonebyres, together with the complete hydro-electric auxiliaries, were supplied by the English Electric Co. The conversion of one set at Bonnington has already been carried out—the stators of the alternators are being rewound at site, while the rotors will be returned to the Stafford Works for conversion from 8 to 16 poles. It is interesting to note that the Bonnington set was converted within the short space of ten weeks.

**London County Council** on November 11 considered tenders for the supply of twelve water tube boilers for the tramways power station. The specification covered twelve 50,000 lb. boilers, giving a total capacity of 600,000 lbs. of steam an hour. The estimate of the general manager of the Tramways Department for the twelve boilers was £200,000. All the firms who submitted tenders stated, however, that with the size of grate specified they could guarantee a continual load of 60,000 lbs. a boiler, so that only ten boilers would give the required output of 600,000 lbs. an hour. Yarrow & Co., Ltd., offered to supply ten instead of twelve units at a proportionate reduction in price. The Highways Committee recommended the

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acceptance, with certain modifications, of so much of the tender of Yarrow & Co., Ltd., as related to the supply of ten boilers, including the distribution switchgear, grit collecting plant made by Pneumatic Conveyances and Extraction (1929), Ltd., and mounted with accessories manufactured by Dewrance & Co., at the reduced figure of £210,225. All the plant to be supplied under the contract will be of British manufacture. The recommendation was adopted.

## LEYTON TRAMCAR CONTRACTS.

Leyton Borough Council has accepted tenders for the 50 new tramcars and equipment required under the renewed agreement for inter-running powers with the London County Council. The tenders were certified to be in order by the general manager of the L.C.C. Tramways. The accepted tenders were as follow :—

Fifty electric double-deck tramcar bodies.—English Electric Co., Ltd., Preston, £89,375. Highest tender, £95,325.

Fifty sets of electrical equipments.—British Thomson-Houston Co., Ltd., London, £40,675. Highest tender, £43,725.

Fifty centre-bearing swing bolster tramcar trucks.—Electro-Mechanical Brake Co., Ltd., West Bromwich, £13,225. Highest tender, £16,033.

Fifty sets of magnetic track and wheel brake equipments.—Metropolitan-Vickers Electrical Co., Ltd., Manchester, £2,537. Highest tender, £4,650.

Car traverser.—Holt & Willetts, Cradley Heath, £425. Highest tender, £950.

The contract for fifty double-deck bodies is the latest of a number of important electric traction contracts that have been placed with the English Electric Co. in recent times. The bodies will be generally similar to the fifty recently completed for the London County Council by the same company and whether considered from the engineering side or from the passengers' point of view, the design sets a new standard in tramcar construction. Structurally the bodies are of metal design, and, therefore, are not only safer and more durable, but give an appreciably greater useful width in the saloons. The seating is particularly luxurious, the backs and seats being upholstered. The floors are covered with special linoleum. The scheme of decoration is simple and bright. Much attention has been given to providing thorough but draughtless ventilation, and in addition to special ventilators the upper saloon is fitted with half-drop windows. Ample illumination is provided on both decks.

## ORDERS FROM LONDON UNDERGROUND RAILWAYS.

The General Electric Co., Ltd., of Magnet House, Kingsway, London, W.C.2, have received from the London Underground Railways Company an important order for the supply of some 300 heavy traction motors for the new rolling stock required in connection with the Cockfosters-Hounslow extension of the Piccadilly line. This order constitutes the ninth successive order for electric traction equipment received by the G.E.C. from the London Underground in the past few years, and when completed will bring the total of modern heavy railway motors of G.E.C. manufacture in use on Underground cars to nearly 2,000.

The General Electric Co. have also received, through the Birmingham Railway Carriage & Wagon Co., Ltd., the order for the complete electrical equipment of 61 new compartment-type coaches now being constructed to the order of the Metropolitan Railway Company, London. The material to be supplied comprises electric traction, lighting and heating equipment for fourteen each of 4-motor motor coaches, driving trailer coaches, first-class trailer coaches, and 19 third-class trailer coaches. The motor coaches will each have a power output of 1,100 h.p. and each be equipped with four self-ventilated motors rating at 275 b.h.p. on the one-hour rating. The control gear will be of the electro pneumatic type.

The equipment for both the above orders will be manufactured throughout at the General Electric Co.'s Witton Engineering Works, Birmingham.

## FOR SALE.

### CITY OF PLYMOUTH.

SURPLUS STORES.

The Corporation has available for disposal considerable quantities of spare parts for trams and Motor Omnibuses of the following makes :—

| | |
|---|---|
| Straker Squire, | Dick Kerr, |
| Shelvoke and Drury, | British Thomson Houston. |
| Metro Vickers, | |

A detailed list of those parts and any further particulars may be obtained from the Stores' Officer, The Old Guildhall, Plymouth.

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# TRAFFIC RETURNS.

## Tramway and Omnibus Undertakings in the United Kingdom.

| NAME OF COMPANY OR CORPORATION | 1929. WEEKS ENDING | | | | | 1930. WEEKS ENDING | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nov. 9 | Nov. 16 | Nov. 23 | Nov. 30 | Dec. 7 | Nov. 8 | Nov. 15 | Nov. 22 | Nov. 29 | Dec. 6 | Wks. | 1930 | Increase or Decrease. |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Aberdeen Corporation ... ... ... | 4,387 | 4,201 | 4,252 | 5,070 | 4,421 | 4,468 | 4,385 | 4,487 | 4,798 | 4,367 | 27½ | 145,000 | + 2,548 |
| Ashton-under-Lyne Corporation ... ... | 1,644 | 1,642 | 1,663 | 1,674 | 1,654 | 1,527 | 1,501 | 1,528 | 1,531 | 1,455 | 36 | 57,375 | — 3,374 |
| Ayr Corporation ... ... ... ... | 442 | 428 | 423 | 449 | ... | 399 | 398 | 396 | 391 | ... | 28 | 17,348 | — 1,406 |
| Barrow Corporation ... ... ... | 892 | 930 | 975 | 899 | 898 | 889 | 886 | 986 | 867 | 841 | 36 | 35,445 | — 593 |
| Belfast City ... ... ... ... | 12,226 | 12,105 | 12,236 | 12,409 | 12,820 | 12,695 | 12,520 | 12,817 | 12,803 | 12,521 | 35½ | 456,288 | + 20,545 |
| Birkenhead Corporation ... ... ... | 4,630 | 4,536 | 4,560 | 4,524 | 4,589 | 5,185 | 5,054 | 5,038 | 5,024 | 4,967 | 36 | 190,043 | — 1,200 |
| Birmingham Corporation ... ... | 42,107 | 41,064 | 42,207 | 43,065 | 42,786 | 42,962 | 42,403 | 42,969 | 41,732 | 42,644 | 36 | 1,525,216 | + 31,005 |
| Blackburn Corporation ... ... ... | 1,790 | 2,225 | 2,102 | 2,187 | 2,115 | 2,019 | 2,021 | 1,933 | 2,073 | 1,938 | 35½ | 75,076 | ... |
| Bradford Corporation ... ... ... | 14,810 | 14,725 | 14,498 | 14,709 | 14,664 | 14,353 | 14,044 | 14,169 | 14,249 | 13,900 | 35 | 514,112 | — 20,422 |
| Brighton Corporation ... ... ... | 2,208 | 2,158 | 2,153 | 2,190 | 2,161 | 2,179 | 2,160 | 2,081 | 2,135 | 2,045 | 35½ | 98,819 | + 1,431 |
| Burnley Corporation ... ... ... | 3,597 | 3,651 | 3,573 | 3,679 | 3,616 | 3,584 | 3,273 | 3,329 | 3,339 | 3,566 | ... | ... | ... |
| Bury Corporation ... ... ... ... | 2,739 | 2,639 | 2,701 | 2,671 | 2,716 | 2,963 | 2,909 | 2,935 | 2,828 | 2,761 | 35½ | 106,061 | + 14,167 |
| Cardiff Corporation ... ... ... | 7,625 | 7,437 | 7,392 | 7,792 | 7,727 | 7,487 | 7,350 | 7,485 | 7,547 | 7,391 | 35½ | 278,244 | + 1,466 |
| Chester Corporation ... ... ... | 409 | 397 | 408 | 414 | 408 | 660 | 647 | 667 | 650 | 624 | 36 | 24,028 | + 8,293 |
| Chesterfield Corporation ... ... ... | 1,963 | 2,008 | 1,974 | 1,988 | 2,010 | 1,889 | 1,878 | 1,893 | 1,970 | 1,882 | 36 | 69,766 | + 645 |
| Colchester Corporation ... ... ... | 545 | 495 | 522 | 567 | 576 | 533 | 536 | 586 | 562 | 531 | 37 | 22,347 | + 2,006 |
| Colne Corporation ... ... ... | 701 | 649 | 648 | 656 | 716 | 689 | 620 | 628 | 638 | 632 | 36 | 25,275 | — 550 |
| Coventry Corporation ... ... ... | 3,884 | 3,819 | 3,960 | 4,125 | 4,074 | 3,693 | 3,644 | 3,800 | 3,702 | 3,803 | 36 | 134,339 | — 1,025 |
| Darlington Corporation ... ... ... | 1,010 | 993 | 993 | 997 | 1,068 | 1,053 | 1,003 | 1,053 | 1,032 | 1,029 | 35½ | 37,884 | + 2,576 |
| Derby Corporation ... ... ... | 3,263 | 3,382 | 3,231 | 3,321 | 3,332 | 3,246 | 3,277 | 3,327 | 3,074 | 3,191 | 36 | 120,260 | + 2,776 |
| Dover Corporation ... ... ... | 360 | 359 | 345 | 366 | 370 | 350 | 363 | 368 | 372 | 335 | 36 | 15,594 | + 454 |
| Dundee City ... ... ... ... | 3,421 | 3,442 | 3,311 | 3,406 | ... | 3,634 | 3,669 | 3,607 | 3,651 | ... | 27½ | 102,534 | + 5,962 |
| East Ham Corporation ... ... ... | 2,327 | 2,306 | 2,262 | 2,399 | 2,417 | 2,200 | 2,212 | 2,191 | 2,195 | 2,166 | 35½ | 81,411 | — 426 |
| Edinburgh Corporation ... ... ... | 17,863 | 17,031 | 17,269 | 17,419 | 17,708 | 18,111 | 18,202 | 17,459 | 17,823 | 17,757 | 29½ | 547,273 | + 15,350 |
| Exeter Corporation ... ... ... | 988 | 975 | 1,028 | 1,019 | 1,035 | 1,094 | 1,043 | 1,095 | 1,056 | 1,038 | 37 | 41,772 | + 3,882 |
| Glasgow Corporation ... ... ... | 52,081 | 51,606 | 51,423 | 52,164 | ... | 53,560 | 54,810 | 52,279 | 52,384 | ... | 26 | 1,362,798 | + 69,487 |
| Gloucester Corporation ... ... ... | 602 | 616 | 621 | 651 | 674 | 707 | 703 | 701 | 746 | 722 | 35½ | 25,514 | + 4,649 |
| Grimsby Corporation ... ... ... | 1,464 | 1,427 | 1,417 | 1,457 | 1,489 | 1,568 | 1,503 | 1,566 | 1,526 | 1,491 | 36 | 57,496 | + 5,491 |
| Halifax Corporation ... ... ... | 5,041 | 4,765 | 5,003 | 4,976 | 5,024 | 4,893 | 4,943 | 5,005 | 4,939 | 4,741 | 36½ | 186,359 | + 17,224 |
| Huddersfield Corporation ... ... | 6,357 | 6,203 | 6,313 | 6,344 | 6,379 | 6,320 | 6,072 | 6,058 | 6,164 | 6,066 | 36 | 229,068 | — 2,780 |
| Hull Corporation ... ... ... ... | 7,725 | 7,530 | 7,463 | 7,700 | 7,844 | 7,680 | 7,428 | 7,599 | 7,601 | 7,535 | 36 | 266,121 | — 451 |
| Ilford Corporation ... ... ... ... | 1,501 | 1,419 | 1,480 | 1,584 | 1,542 | 1,503 | 1,507 | 1,538 | 1,555 | 1,512 | 35½ | 54,374 | + 710 |
| Ipswich Corporation Trolley Buses ... | 1,312 | 1,228 | 1,241 | 1,298 | 1,291 | 1,317 | 1,290 | 1,298 | 1,332 | 1,254 | 35½ | 48,740 | + 2,410 |
| Isle of Thanet ... ... ... ... | 404 | 380 | 343 | 387 | 376 | 374 | 364 | 366 | 357 | 345 | 48½ | 39,627 | — 4,612 |
| Kilmarnock Corporation ... ... | 488 | 478 | 482 | 489 | 493 | 496 | 486 | 499 | 497 | 471 | 29½ | 14,563 | + 557 |
| Leeds Corporation ... ... ... ... | 19,549 | 19,338 | 19,245 | 19,793 | 19,506 | 19,843 | 19,589 | 19,439 | 19,562 | 19,295 | 35½ | 713,484 | + 10,131 |
| Leicester Corporation ... ... ... | 8,580 | 8,490 | 8,592 | 8,750 | 8,789 | 8,373 | 8,420 | 8,622 | 8,233 | 8,413 | 36 | 301,326 | — 1,157 |
| Lincoln Corporation Buses ... ... | 871 | 830 | 572 | 906 | ... | 853 | 830 | 893 | 858 | ... | 35 | 32,752 | + 175 |
| Liverpool Corporation ... ... ... | 30,192 | 29,704 | 29,546 | 30,031 | 30,579 | 29,855 | 29,624 | 29,170 | 29,444 | 29,248 | 35½ | 1,061,534 | — 2,582 |
| London County Council ... ... ... | 83,584 | 85,315 | 80,593 | 84,606 | 85,853 | 82,590 | 83,131 | 80,963 | 82,649 | 82,450 | 35½ | 2,920,508 | — 36,690 |
| Luton Corporation ... ... ... | 384 | 386 | 373 | 393 | 400 | 382 | 368 | 368 | 400 | 381 | 35½ | 14,901 | + 242 |
| Maidstone Corporation ... ... ... | 753 | 748 | 718 | 744 | 761 | 786 | 786 | 787 | 807 | 786 | 35½ | 31,468 | + 2,145 |
| Manchester Corporation ... ... ... | 40,136 | 39,877 | 39,758 | 40,375 | 40,252 | 41,276 | 41,164 | 40,913 | 41,217 | 40,637 | 36 | 1,466,175 | + 29,558 |
| Middlesbrough Corporation ... ... | 1,727 | 1,569 | 1,677 | 1,699 | 1,792 | 1,446 | 1,450 | 1,479 | 1,530 | 1,473 | 36½ | 57,274 | — 3,374 |
| Newcastle-on-Tyne Corporation ... | 11,441 | 10,974 | 10,970 | 11,229 | 11,538 | 11,863 | 11,900 | 11,588 | 11,843 | 11,842 | 35½ | 424,556 | — 6,879 |
| Newport Corporation ... ... ... | 2,458 | 2,451 | 2,416 | 2,533 | ... | 2,291 | 2,327 | 2,361 | 2,359 | ... | 35 | 84,414 | — 570 |
| Northampton Corporation ... ... | 1,815 | 1,776 | 1,720 | 1,788 | 1,801 | 1,801 | 1,796 | 1,774 | 1,764 | 1,751 | 35½ | 65,127 | + 1,357 |
| Nottingham Corporation ... ... ... | 9,758 | 9,858 | 9,623 | 9,928 | 10,028 | 10,466 | 10,542 | 10,257 | 10,107 | 10,245 | 35½ | 368,804 | + 25,962 |
| Oldham Corporation ... ... ... | 5,664 | 5,484 | 5,524 | 5,637 | 5,546 | 5,301 | 5,096 | 5,210 | 5,144 | 4,895 | 37 | 195,968 | — 10,327 |
| Plymouth Corporation ... ... ... | 5,674 | 5,377 | 5,532 | 5,746 | 5,929 | 5,802 | 5,655 | 5,713 | 5,779 | 6,018 | 35½ | 220,042 | + 12,265 |
| Portsmouth Corporation ... ... ... | 5,567 | 5,266 | 5,231 | 5,402 | 5,650 | 6,189 | 6,176 | 6,066 | 6,220 | 6,269 | 36 | 271,871 | + 31,886 |
| Preston Corporation ... ... ... | 2,237 | 2,263 | 2,112 | 2,191 | 2,226 | 2,199 | 2,082 | 2,063 | 2,155 | 2,043 | 35½ | 77,360 | — 1,891 |
| Rawtenstall Corporation ... ... ... | 1,401 | 1,367 | 1,368 | 1,373 | 1,434 | 1,307 | 1,311 | 1,323 | 1,323 | 1,279 | 35½ | 48,182 | — 1,062 |
| Reading Corporation ... ... ... | 2,419 | 2,380 | 2,384 | 2,466 | 2,606 | 2,487 | 2,382 | 2,436 | 2,473 | 2,466 | 36 | 87,819 | + 676 |
| Rochdale Corporation ... ... ... | 4,419 | 4,385 | 4,302 | 4,415 | 4,385 | 4,403 | 4,320 | 4,365 | 4,285 | 4,225 | ... | 155,256 | — 6,003 |
| Rotherham Corporation ... ... ... | 2,657 | 2,664 | 2,705 | 2,735 | 2,798 | 2,684 | 2,714 | 2,789 | 2,639 | 2,555 | 36 | 100,143 | + 2,105 |
| Salford Corporation ... ... ... | 11,284 | 11,087 | 11,652 | 11,342 | 11,271 | 10,972 | 11,000 | 11,232 | 11,092 | 10,865 | 35½ | 400,156 | — 2,815 |
| Sheffield Corporation ... ... ... | 21,125 | 21,191 | 20,837 | 21,695 | 21,303 | 20,132 | 20,222 | 19,991 | 19,924 | 19,739 | 35½ | 729,575 | — 27,803 |
| Southampton Corporation ... ... | 4,214 | 4,226 | 3,975 | 4,236 | 4,398 | 4,259 | 4,181 | 4,054 | 4,307 | 4,208 | 36 | 155,727 | + 4,997 |
| Southend-on-Sea Corporation ... ... | 2,016 | 1,860 | 1,938 | 1,983 | 1,972 | 1,983 | 1,911 | 1,983 | 1,950 | 1,849 | 36½ | 91,853 | — 483 |
| Southport Corporation ... ... ... | 1,515 | 1,495 | 1,466 | 1,495 | 1,488 | 1,562 | 1,525 | 1,481 | 1,515 | 1,426 | 35½ | 63,856 | + 606 |
| St. Helens Corporation ... ... ... | 1,951 | 2,001 | 1,876 | 1,930 | 2,019 | 2,162 | 2,077 | 1,988 | 2,116 | 2,025 | 35½ | 72,398 | + 3,571 |
| Sunderland Corporation ... ... | 2,589 | 2,565 | 2,533 | 2,619 | 2,697 | 2,814 | 2,702 | 2,849 | 2,713 | 2,754 | 36 | 109,421 | + 12,229 |
| Swindon Corporation ... ... ... | 796 | 827 | 795 | 863 | 856 | 937 | 988 | 928 | 1,009 | 974 | 35½ | 35,030 | + 6,409 |
| Wallasey Corporation ... ... ... | 3,024 | 3,020 | 2,946 | 3,032 | 3,021 | 3,093 | 3,123 | 2,994 | 3,078 | 2,926 | 35½ | 128,122 | + 3,938 |
| Walsall Corporation ... ... ... | 3,467 | 3,413 | 3,479 | 3,598 | 3,585 | 3,797 | 3,694 | 3,748 | 3,708 | 3,717 | 36 | 127,671 | + 4,066 |
| Walthamstow Corporation ... ... | 2,409 | 2,319 | 2,362 | 2,439 | 2,464 | 2,380 | 2,372 | 2,356 | 2,381 | 2,296 | 35½ | 88,229 | — 655 |
| Warrington Corporation ... ... ... | 1,358 | 1,403 | 1,363 | 1,414 | 1,459 | 1,441 | 1,414 | 1,403 | 1,465 | 1,395 | 36 | 50,303 | + 2,065 |
| West Ham Corporation ... ... ... | 6,200 | 6,272 | 5,895 | 6,350 | 6,412 | 5,891 | 5,917 | 5,862 | 6,004 | 6,033 | 35½ | 213,814 | — 2,513 |
| Wolverhampton Corporation ... ... | 6,074 | 5,975 | 6,133 | 6,265 | 6,210 | 5,907 | 5,716 | 5,695 | 5,768 | 5,686 | 36 | 212,902 | — 8,763 |
| York Corporation ... ... ... ... | 1,571 | 1,524 | 1,478 | 1,588 | 1,614 | 1,501 | 1,446 | 1,526 | 1,489 | 1,394 | 37 | 56,993 | + 1,021 |

## Underground Electric Railways Company of London, Limited.

| NAME OF COMPANY | 1929. WEEKS ENDING | | | | | 1930. WEEKS ENDING | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nov. 9 | Nov. 16 | Nov. 23 | Nov. 30 | Dec. 7 | Nov. 8 | Nov. 15 | Nov. 22 | Nov. 29 | Dec. 6 | Wks. | 1930. | Increase or Decrease. |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Underground Co. (Common Fund Co.) ... | 295,300 | 277,300 | 286,200 | 288,700 | 292,600 | 301,900 | 305,200 | 294,800 | 296,700 | 299,300 | 49 | 14,776,800 | + 750,400 |
| London and Suburban District ... ... | 43,200 | 40,300 | 42,100 | 43,100 | 43,400 | 43,900 | 44,200 | 43,200 | 43,500 | 43,500 | 49 | 2,174,700 | + 114,400 |

## Colonial and Foreign Tramway Traffic Returns.

| NAME OF COMPANY OR CORPORATION | 1929. WEEKS ENDING | | | | | 1930. WEEKS ENDING | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nov. 9 | Nov. 16 | Nov. 23 | Nov. 30 | Dec. 7 | Nov. 8 | Nov. 15 | Nov. 22 | Nov. 29 | Dec. 6 | Wks. | 1930 | Increase or Decrease. |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Anglo-Argentine ... ... ... ... | 87,553 | 89,900 | 89,203 | 88,076 | 92,481 | 80,128 | 81,045 | 79,884 | 78,479 | 80,186 | 49 | 4,001,448 | — 241,011 |
| Buenos Aires Lacroze ... ... ... | 12,388 | 12,481 | 12,233 | 11,959 | 12,798 | 12,222 | 12,222 | 11,786 | 11,349 | 12,222 | 23 | 257,317 | — 14,438 |
| Calcutta ... ... ... *Rupees* | 127,402 | 125,240 | 133,487 | 124,108 | 125,868 | 106,314 | 105,723 | 104,834 | 104,085 | 105,317 | 48½ | 5,323,594 | — 832,838 |
| Madras (2 weeks) ... ... *Rupees* | ... | 43,821 | ... | 38,577 | ... | ... | 45,521 | ... | 36,061 | ... | 46 | 1,009,196 | + 48,068 |

| | 1929. | | | | | | 1930. | | | | | | AGGREGATE. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | June | July | Aug. | Sept. | Oct. | Nov. | June | July | Aug. | Sept. | Oct. | Nov. | Mths. | 1930 | Increase or Decrease. |
| | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | £ | | £ | £ |
| Brazilian Trac. $ | 4,210,893 | 4,335,895 | 4,333,460 | 4,225,416 | 4,289,258 | 4,145,850 | 4,146,884 | 4,081,018 | 3,792,808 | 3,906,162 | 3,714,677 | ... | 10 | 39,781,024 | — 1,440,030 |
| British Columbia $ | 1,133,017 | 1,156,720 | 1,168,753 | 1,169,278 | 1,230,278 | 1,270,922 | 1,144,585 | 1,196,239 | 1,194,390 | 1,206,579 | 1,248,830 | ... | 4 | 4,846,038 | + 121,008 |
| Burma ... Rs. | 63,157 | 64,649 | 61,309 | 59,467 | 62,905 | 62,191 | 66,317 | 66,444 | 66,418 | 65,852 | 64,928 | ... | 3 | 197,198 | + 19,376 |
| Cape Town ... | 27,995 | 27,779 | 27,636 | 26,579 | 27,501 | ... | 25,525 | 24,953 | 24,690 | 24,295 | 25,312 | ... | ... | ... | ... |
| Carthagena & H.... | 1,476 | 1,100 | 1,169 | 660 | 1,953 | 1,350 | 515 | 738 | 505 | 437 | 559 | 553 | 11 | 8,404 | — 3,649 |
| Durban ... ... | 24,308 | 29,110 | 25,619 | 22,371 | 24,320 | 23,214 | 23,440 | 27,049 | 25,071 | 21,156 | 22,693 | ... | 3 | 68,920 | — 3,390 |
| East India ... | 3,772 | 3,801 | 4,152 | 4,126 | 4,078 | 3,905 | 3,803 | 3,833 | 3,948 | 3,731 | 3,809 | 3,507 | 4 | 14,995 | — 1,266 |
| Kalgoorlie... ... | 1,660 | 1,664 | 2,100 | 1,980 | 1,703 | ... | 1,753 | 1,776 | 2,110 | 2,061 | ... | ... | 9 | 15,833 | + 228 |
| Para ... ... | 15,450 | 15,044 | 15,224 | 15,200 | 17,887 | 15,542 | 15,028 | 14,816 | 12,681 | 12,196 | 12,110 | ... | 11 | 155,610 | — 10,803 |
| Port Elizabeth ... | 7,335 | 7,503 | 7,402 | 7,190 | 7,593 | ... | 6,951 | 7,045 | 6,955 | 6,670 | 6,904 | ... | ... | ... | ... |
| Rangoon ... Rs. | 114,535 | 122,630 | 123,550 | 122,850 | 132,742 | 137,703 | 142,170 | 151,300 | 146,320 | 147,775 | 158,285 | 154,965 | 11 | 1,658,280 | + 309,994 |
| Shanghai ... $ | 335,740 | 329,139 | 335,172 | 365,828 | 371,611 | 360,247 | 367,231 | ... | 386,112 | 418,059 | 445,900 | 430,394 | 11 | 3,974,052 | + 246,145 |
| Singapore ... $ | 123,000 | 131,000 | 130,000 | 126,000 | 133,000 | 126,000 | 140,000 | 145,000 | 142,000 | 140,000 | 142,000 | 134,000 | 2 | 276,000 | + 17,000 |
| Winnipeg ... $ | 517,738 | 497,935 | 494,642 | 518,521 | 545,308 | 597,391 | 479,958 | 452,212 | 445,908 | 484,609 | 523,660 | ... | 10 | 5,179,893 | — 216,591 |

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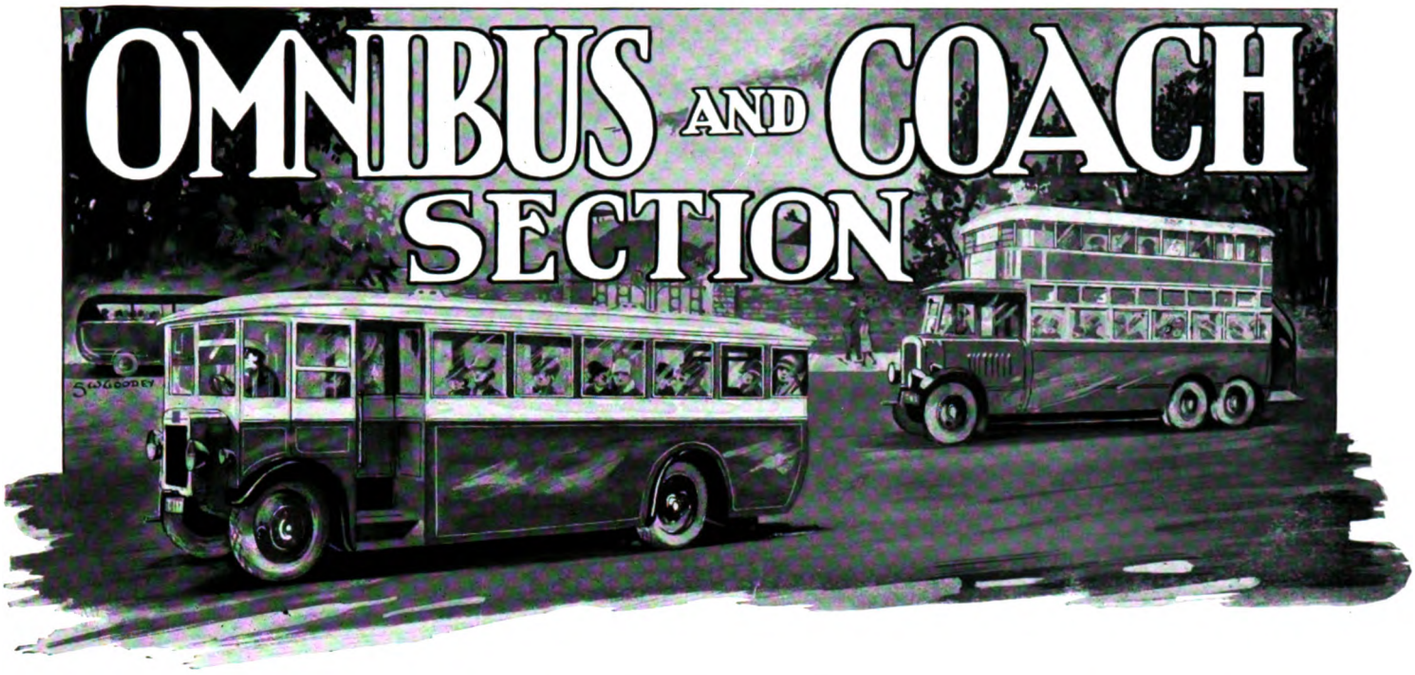


**OMNIBUS AND COACH SECTION—TWENTY-FIFTH YEAR OF PUBLICATION.**

### MOTOR COACHES UNDER THE NEW ACT.

After January 1 next, by the provisions of the Road Traffic Act, the speed of motor coaches will be limited to a maximum of 30 M.P.H., and there is little doubt that the authorities will enforce this regulation. The problem is a serious one for coach proprietors, as many of the long-distance journeys will become practically impossible. For some time past the majority of the operators, while publishing complete departure times of their services, have given little or no indication of the time of arrival. It is indeed well known that a high average speed has been maintained, especially on the longer journeys. The traffic delays in London and other large towns must necessarily restrict the speed in those areas, and it follows that to maintain the present high average on the through journey a speed of 50 m.p.h. or more must be run on the country roads. As many sections of these country roads and narrow village streets are ill-suited for traffic of this kind, there can be no question that the speeds that have now become so common are excessive, and frequently dangerous. The possibilities under the new conditions are naturally receiving the serious consideration of the coach proprietors, and experimental runs are being made to ascertain to what extent the new speed limit will affect the times of certain services. Many of the long-distance facilities have been inaugurated in open competition with the railway. While the cheaper fare has attracted traffic to the road vehicle, the time factor has also been of considerable importance; it is the recognition of this fact which has induced the proprietor so to accelerate his services that the present high average speed has been attained. With the limitation of speed, the distance which can be covered in a reasonable time will be considerably shortened. The outcome of the change must inevitably mean the return to the railways of some of the long-distance traffic which has been lost to the road services. With the natural growth of the travel habit, however, there is little doubt that when the transport systems have settled down to the new conditions, full use will be made of the facilities offered by each system. Then, following the co-ordination which the railway companies are establishing between their road and rail services, each form of transport will find its natural sphere of usefulness within the new regulations, to the advantage of the travelling public.

### THE TROUBLES IN AMERICA.

Even to observers on this side of the Atlantic, it has been apparent for some time that the railroad companies in the United States have been suffering more and more from competition on the highways, both as regards passenger and goods traffic. Probably the effect of such competition is in many areas more severe than corresponding competition in this country, as there is such a large mileage of railways in sparsely populated country, where, consequently, the amount of traffic per mile of route is comparatively small. Omnibuses and lorries seem now to be running all over the United States, and the competition has become serious. This must, of course, apply mainly to shorter distance passenger journeys and freight hauls. It is apparent that what the United States railways require is an adaptation to American conditions of our Road Traffic Act, which now promises successfully to blossom forth. According to the New York correspondent of the *Times*, the railways, faced by this unregulated road competition, are preparing a demand for drastic relief from Congress. They want all forms of inter-State commerce placed under the jurisdiction of the Inter-State Commerce Commission—a powerful body with already wide powers so far as railways are concerned. The railway companies want the inter-State movement of freight and passengers by lorries and omnibuses to be brought under Federal regulation, and that railways should be able to run steamers coastally and on the Great Lakes under same terms as steamship lines. There is another demand for pipe-line (oil) conditions, but that is a feature inapplicable to this country. Traffic on the highways has increased enormously, and

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# OMNIBUS AND COACH SECTION

the railways have lost much revenue. In fact, the case of the railways is represented as becoming desperate. As to remedial measures, the British Road Traffic Act is no doubt inapplicable in detail to the very different conditions in the United States which really consist, with a few exceptions, of a large number of separate extensive countries. Probably Congress when it tackles the subject will have to follow our lead in the way of co-ordination, co-operation, merging of interests, abolition of useless competition, and special regard to the adequacy of existing railway services.

### OBSOLETE VEHICLES.

There appears to be little doubt that one effect of the new regulations under the Road Traffic Act will be the clearing off the roads of the obsolete omnibuses and coaches, many of which have been a menace to other road users. Under the Act, the holder of a public service vehicle licence is called upon to report any accident to, or failure of, his vehicle, if such accident or failure is likely to affect the safety of the passengers, or other users of the road. These reports will be handed on to an inspecting officer, who will have the power of suspending the licence if, in his opinion, the vehicle is unfit for service. The power of the inspecting officers, however, is not limited to action only when notice is given of accident or failure, but applies to all public service vehicles. They may at any time stop vehicles on the road or enter garages for the purpose of examining a conveyance they have reason to believe is unfit for service. While on the face of it, this may appear to be placing too much power in the hands of the examining officers, in practice the arrangement should work for the good of the public transport industry generally, as it will only be the really defective vehicles that will be taken out of service. To ensure that this will be so, a perid of 48 hours will be given to remedy the defects reported or discovered, so that if the licensee can satisfy the examiner that the defects have been or are being remedied, the licence will not be suspended. The removal of worn out and unsuitable vehicles from the road will prevent congestion, and give much satisfaction to the operators of regular passenger services. Frequently it happens that considerable delay is caused at busy centres by the failure of old vehicles to negotiate steep grades and narrow streets at reasonable speed, thereby causing congestion by the holding up of long lines of vehicles.

### LIMITATION OF DRIVERS' HOURS.

Apparently Section 19 of the Road Traffic Act does not trouble the managers of omnibus undertakings in the way that is the case with the owners of commercial and industrial vehicles. The reason is that the eight-hour day for drivers and conductors has become firmly established with municipal owners and with many of the private owners. On the commercial and industrial side, the requirements of Section 19 have alarmed the employers of some 500,000 drivers and mates. Almost the entire distributing trade is affected, and its organised representatives are about to confer with the Minister of Transport. Mr. Morrison has received from them a memorandum embodying suggestions which would protect the public against risks due to drivers suffering from excessive fatigue, but would not uproot the present arrangements, as would be the case, it is asserted, if the wording of the Act is rigidly adhered to in the regulations. The Minister has wisely deferred from December 1 to February 1 the coming into force of the regulations. The Act prohibits continuous employment for more than 5½ hours or a greater total than 11 hours in any 24, or any arrangement which does not give a man 10 consecutive hours for rest in every 24 hours. No offence is committed if the time limit is exceeded because a journey is uncompleted owing to unforeseen circumstances, as, for instance, a mechanical defect delaying a motor coach. A wise provision is that power is given to the Minister, after referring the matter to the Industrial Court for advice, to vary the periods of time if he is of the opinion that such variation is not likely to be in no way detrimental to the public safety. Endless trouble will be saved if revision can be made now instead of when the section is in operation. There is one thing to which responsible owners should not object, namely that no consideration should be given to those who overwork drivers on the public roads. On the passenger-carrying side, the area commissioners possess powers that will be exercised for the protection of the employee and the good employer.

### CONSTRUCTION REGULATIONS.

Many important matters are dealt with by the draft regulations under the Road Traffic Act which builders and owners of road transport vehicles are now considering. Some time must elapse before the various organisations concerned can conclude their negotiations with the Minister of Transport. Four of the proposals affecting public passenger vehicles are to come into force on January 1, 1932, and each has an important bearing upon public safety. Two of them may be the means of preventing outbreaks of fire which in the past have injured and killed passengers and destroyed the vehicles. One decrees that fuel tanks must be encased or screened, and must not be placed under any gangway or door of a single-deck vehicle or of the lower deck of a double-deck omnibus or coach. It is to be hoped that the case or screen will be of such strength that there will be no more instances of the tank being pierced in a collision and of the resulting spark firing the petrol. Another requirement is that carburettors and such like must be placed so that any fuel leaking therefrom will not fall on anything capable of igniting it or into any place where it might accumulate. The third regulation calls for a guard rail, running board or similar device to be fixed in the space between front and rear wheels on both sides to within at least 9 in. of the ground. The fourth requires that exposed propeller-shafts be protected by a bar or bars having an eye or bridle surrounding such shafts, to minimise the damage resulting from a fracture. These regulations are suggested by accidents that have occurred in the past. That such accidents have been few is a testimony to British-built motor vehicles. The proposals will not be costly to carry into effect.

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# OMNIBUS AND COACH SECTION

## CHAIRMEN OF THE TRAFFIC COMMISSIONERS.

The Minister of Transport has announced in the House of Commons the following appointments as Chairmen of Traffic Commissioners under the Road Traffic Act, 1930. The Chairmen will take up their duties on or about January 1, 1931.

| *Traffic Areas in England.* | *Name.* | *Previous Appointments.* |
|---|---|---|
| Northern .. .. .. | Mr. H. Riches, O.B.E. .. .. .. | Chief Constable, Middlesbrough |
| Yorkshire .. .. .. | Mr. J. Farndale, C.B.E. .. .. | Chief Constable, Bradford |
| North Western .. .. | Mr. W. Chamberlain .. .. .. | General Manager, Belfast City Tramways |
| West Midland .. .. | Col. A. S. Redman, C.B., M.Inst.T., R.E. | Formerly Assistant Director of Transport and now Assistant Adjutant-General, War Office |
| East Midland .. .. | Mr. J. H. Stirk, J.P., M.Inst.T .. .. | Transport Manager, Birmingham Co-operative Society |
| Eastern .. .. .. | Sir E. Haviland Hiley, K.B.E. .. | *Chairman, Rhodesian Railways Commission |
| South Wales .. .. | Mr. A. T. James, K.C. .. .. .. | |
| Western .. .. .. | Mr. A. F. Nicholson, O.B.E. .. .. | Chief Constable, Exeter |
| Southern .. .. .. | Major-General Sir R. Ford, K.C.M.G., C.B., D.S.O. | Formerly Deputy Quartermaster-General |
| South Eastern .. .. | Mr. Rowland Harker, K.C. .. .. | |
| *Traffic Areas in Scotland.* | | |
| Northern .. .. .. | Sir John Maxwell, C.M.G. .. .. | After qualifying as a Solicitor in Scotland, has held Administrative Posts in the Colonial Service |
| Southern .. .. .. | Mr. Archibald Henderson .. .. | National Secretary, Road Transport Group (Commercial), Transport and General Workers' Union; Member of London and Home Counties Traffic Advisory Committee |

*Sir E. Haviland Hiley, K.B.E., was formerly General Manager, New Zealand Government Railways, and a Member of the Royal Commission on Local Government of Greater London.

### NOTES ON THE APPOINTMENTS

THE MINISTER OF TRANSPORT, in making the announcement, said: Appointments have been made to 12 of the 13 Traffic Areas. As I indicated in the course of the discussions on the Bill, it is not proposed to remunerate the Commissioners appointed from the panels nominated by local authorities, but they will receive payment of their travelling and out-of-pocket expenses. The estimated cost of the salaries and expenses of the Traffic Commissioners and their offices for the year 1931-32 is about £150,000, which in part represents expenditure transferred from the existing licensing authorities. The estimated cost of the chairmen's salaries is between £15,000 and £16,000.

COL. HOWARD-BURY: How much of the £150,000 is new expenditure?

MR. MORRISON: So far as the Road Fund is concerned it is all new, but as against that, to an amount I cannot state, the local authorities will save what they at present spend on their licensing functions.

MR. TURTON asked whether the salaries were on a rising scale?

MR. MORRISON: No, they are fixed, but I cannot commit myself that a revision may not be made in the future. Generally, in making the appointments, candidates have been selected with varying types of experience, because from time to time they will meet together, and I did not want them all to be of the same experience. One of them is an experienced traffic manager, with special knowledge of the co-ordination of traffic. Legal experience is represented; and I have considered it important to include in the list a well-qualified person familiar with the conditions of labour in heavy transport on the roads. The Welsh member understands and speaks Welsh.

MR. HENRY RICHES, O.B.E., Chief Constable of Middlesbrough, had the distinction of being the first Chairman of Area Traffic Commissioners to be offered and to accept that position. The Northern Area includes Northumberland, Cumberland, Durham, and Westmorland, and parts of Lancashire and Yorkshire, and his headquarters will be at Newcastle-upon-Tyne. Mr. Riches has had an interesting career. He has held every rank in the police service, from constable to chief constable, and in all branches of the service—uniform, clerical, and detective. His activities also show that he has made a study of traffic problems and that he has no mean powers of organisation.

A native of Norfolk, he joined the Metropolitan Police as a constable, and four years later he went to the Norwich City Police, where for seven years he was assistant to the Chief Constable. Then followed four years as Chief Constable of Scarborough, and in 1902 he was appointed Chief Constable of Middlesbrough, so that he has held that appointment for 28 years. He is also Chief Inspector of Public Service Vehicles, an appointment made in 1925, when the powers of licensing, supervision, and inspection were delegated by the Town Council to the Watch and Licensing Committee. He submitted a scheme to the Committee to centralise the handling of all public service vehicles, and initiated timetables and "headway" for all services operating in and out of Middlesbrough. The scheme was the means of eliminating all out-

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# OMNIBUS AND COACH SECTION

of-date vehicles, so that now only the very latest and up-to-date omnibuses operate in the city.

In October, 1927, in consultation with Councillor T. M. Scott, chairman of Eston Urban Council, Mr. Riches was instrumental in setting up the Tees-side Regional Committee for the control of public-service vehicles operating in North Yorkshire and South Durham. All the county boroughs, urban councils, and district councils joined this scheme, and the whole network of public service vehicles within the area is now worked and controlled with the regularity of a railway service, the scheme being an undoubted success. It is in fact a miniature traffic area, extending from Whitby in the south to Durham in the north. In March, 1929, Mr. Riches explained the scheme to the Royal Commission on Transport, and the organisation met with the whole-hearted approval of the Commissioners. Under this organisation Mr. Riches is chairman of the Committee of Public Service Vehicle Inspectors and Police Representatives.

Mr. Riches was honorary secretary of the committee of chief constables and road users set up by the Home Secretary in 1922 to consider the question of standardising signals to be used by constables in controlling traffic and by drivers of motor cars and other vehicles. As a result of this committee's deliberations, signals were standardised and are the recognised form used throughout Great Britain at the present time. He was also honorary secretary of the committee set up by the Home Office in 1924 of representatives of the police forces and road users to consider traffic problems from the police and road users' point of view. A comprehensive scheme was submitted, and many of the recommendations form part of the new Road Traffic Act. He has served on many other committees dealing with traffic problems, and not long ago gave evidence before the Royal Commission on Transport, the Royal Commission on Licensing, and the Royal Commission on Police Powers and Procedure.

Mr. Riches is a past president (1922) of the Chief Constables' Association; is one of the original promoters of the Police Athletic Association, and has been its honorary secretary since its formation; and for some years he has been honorary secretary of the preliminary meeting of the Central Conference of Chief Constables under the Home Office co-ordination scheme. When the Prince of Wales visited Tees-side in July last to open the Constantine College the arrangements made by Mr. Riches were so excellent that the Middlesbrough Watch and Licensing Committee passed a special resolution congratulating him and expressing their pride. In 1916 he was awarded the King's Police Medal for a specially distinguished record in administrative service, and in 1918 he was awarded the Order of the British Empire for distinguished administrative civil service during the war.

It will be seen from this record that Mr. Riches has a consistent record of efficient administrative and organising work, both in the purely police service and in dealing with traffic problems. For the past few weeks he has been on loan from the Middlesbrough Watch Committee to the Ministry of Transport to assist in taking the measures necessary to bring into operation those sections of the Act relating to public service vehicles.

Sir E. Haviland Hiley was in the service of the North Eastern and Great Northern Railway Companies between 1891 and 1913. From 1913 to 1919 he was General Manager of the New Zealand Government Railways. He was a Member of the Royal Commission on Local Government of Greater London (1921-23), and also served on certain special committees to investigate transport conditions in India, Rhodesia, and elsewhere. In 1927-28 he was Chairman of the Rhodesian Railway Commission.

Mr. William Chamberlain in being appointed to the North Western Area, returns to his native territory. This area includes several of the Welsh counties, Cheshire, and parts of Derbyshire and Lancashire, and his headquarters will be at Manchester.

Mr. Chamberlain has been general manager and chief engineer of the Belfast Corporation Transport since October 2, 1928. Before that he was for three and a half years general manager of Leeds Corporation Transport. He is a native of Lancaster, where he completed his technical education at the Storey Institute, and followed this by a three years' apprenticeship in the Lancaster electricity department. For the following three years he was engineer in charge at Wallasey electricity department, afterwards becoming chief assistant electrical engineer to the Mersey Docks and Harbour Board.

A great part of his professional career was then spent at Oldham. He was for twelve years mains superintendent and commercial engineer in the electricity department, after which he held the position of joint borough electrical engineer and manager for four years. He was appointed general manager and engineer of the tramways department early in 1918. Just before leaving Oldham, Mr. Chamberlain was engaged in organising a trolleybus system in connection with a through service between Oldham and Ashton-under-Lyne.

In April, 1925, he was appointed general manager of Leeds Corporation Transport. There he had much experience in dealing with omnibus competition which was at that time very severe. At both Belfast and Leeds he brought about notable improvements in the tramway and omnibus services. His aim was to introduce the universal fare of one penny for any distance. In the year 1929 he was president of the Municipal Tramways and Transport Association, and in that capacity gave evidence for the municipal tramways before the Royal Commission on Transport.

Mr. Chamberlain's departure from Belfast is greatly regretted. It is admitted by members of the City Council that he has transformed the entire municipal transport services and has lifted the tramway undertaking from a critical position into one of the finest in the country, and made it pay. For the last financial year the net surplus was £92,880. Following his resignation from the Belfast tramways members of the Council in open meeting spoke in the highest terms of Mr. Chamberlain's work and congratulated him on his new appointment.

Colonel A. S. Redman is a member of the Institute of Transport. During 1914-20 he was an officer of the Movements Directorate at the War Office, and acted as liaison officer with the Railway Executive Committee. From 1921 to 1924 he was Assistant Director of Movements, and from 1924 to 1925 Assistant Director of Transportation, War Office, and has been Assistant Adjutant-General at the War Office since 1926.

Mr. J. H. Stirk is the Transport Manager of the Birmingham Co-operative Society. Prior to this appointment he was with the Midland Railway Company. He is a Justice of the Peace for the City of Birmingham; Vice-Chairman, Birmingham Section, Institute of Transport; Chairman, West Midlands Division, Commercial Motor Users' Association; and Vice-Chairman, National Council, Commercial Motor Users' Association and of the Birmingham Motor Coach Owners' Association.

Mr. A. T. James, K.C., before being called to the Bar in 1911, practised as a solicitor in Pontypridd. He has since practised in Cardiff and subsequently in London, and on the South Wales Circuit, and became a K.C. in 1928. Mr. James both understands and speaks the Welsh language.

Mr. A. F. Nicholson is Chief Constable of Exeter, and in that capacity has had experience in the regulation and co-ordination of road passenger services.

Major-General Sir Reginald Ford served in the Royal Army Service Corps from 1893 to 1919. He thus acquired exceptional experience in the organisation of transport. He was in control of transport operations during the South African War, and during the Great War was Deputy Quartermaster-General at General Headquarters in France. From 1924 to 1929 he was General Manager and subsequently Managing Director of the Dunlop Rubber Company in India. From 1925 to 1929 he was Chairman of the West India Automobile Association.

Mr. Rowland Harker, K.C., was admitted as a solicitor in 1900. He was called to the Bar in 1905, and practised on the South Eastern Circuit and in London. Since 1919 he has practised at the Parliamentary Bar. He became a K.C. in 1926.

Sir John Maxwell was born in Kirkcudbrightshire, and after studying at Glasgow University, qualified as a solicitor in Dumfries. subsequently he was appointed to the Colonial Service, and has acted as Governor, Colonial Secretary, Attorney-General, and Solicitor-General on the Gold Coast, where he has been Chairman of various Commissions and Committees, including that on the reorganisation of the Government Motor Transport service.

Mr. Archibald Henderson was born in Edinburgh and was at one time a tramway conductor. He is National Secretary of the Road Transport Group (Commercial) of the Transport and General Workers' Union. He has been a member of the London and Home Counties Advisory Committee since August, 1929, on which he represents the interests of Labour engaged in the transport industry in the London Traffic Area.

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# OMNIBUS AND COACH SECTION

## DUTIES OF THE TRAFFIC COMMISSIONERS.

STATEMENT BY THE MINISTER OF TRANSPORT.

Mr. Herbert Morrison, in reply to a question in the House of Commons recently, said: The main duties to be performed by the Area Traffic Commissioners, otherwise than in the Metropolitan Traffic Area, may be summarised as follow:—

(1) The granting of public service vehicle licences and the inspection of such vehicles from the point of view of fitness and suitability.

(2) The granting and backing of road service licences and the attaching of conditions thereto for the control and co-ordination of passenger services by road.

(3) The granting of licences to drive or to act as conductor of a public service vehicle.

(4) The granting of consents to local authorities to operate public service vehicles on routes outside their areas under Part V of the Act.

(5) Advising the Minister on orders made by local authorities under Section 90 of the Act in respect of the routes, stopping places, parking places and stands for public service vehicles.

(6) All matters incidental to the above such as:—

(*a*) The holding of public sittings for the hearing of applications for, and objections to, the grant or backing of road service licences and for other purposes.

(*b*) The collection of fees.

(*c*) The keeping of accounts and records.

(*d*) The presentation of an annual report, etc.

## PROGRESS OF THE ROAD OIL ENGINE.

OUSTING OF THE PETROL ENGINE PREDICTED.

"Progress in the application of the Diesel or Heavy-Oil Engine to Road Transport" was the title of a paper read by Major W. H. Goddard, A.M.I.Mech.E., at a meeting of the Diesel-Engine Users' Association on November 21, at Caxton Hall, Westminster. The chair was occupied by Mr. A. W. A. Chivers, the President of the Association.

Major Goddard remarked that about eighty lorries and ten omnibuses were now running under Diesel power, some using Diesel oil fuel in a petrol engine converted to the use of this oil. These conversion sets included the Godward vaporiser, a British invention, largely used on omnibuses in Philadelphia. The greatest development of the oil engine would be with omnibuses, for the reason that omnibuses ran large and steady mileages, and therefore showed up the great economy and other advantages of the Diesel engine more than any other vehicle. The pioneer omnibus (single-deck) which had a Mercedes-Benz six-cylinder engine, was started at Sheffield in March 1930.* A week later the Barton Transport Co. introduced, on a single-deck omnibus, a Gardner four-cylinder engine at Beeston, Notts., and later they put into service several more vehicles with the same make of engine. In September last, Leeds Corporation introduced a double-deck Crossley omnibus with a Gardner six-cylinder engine, and similar omnibuses were being built for Sheffield and Manchester Corporations.

There was ample proof, the author said, of the extraordinary economy which the Diesel engine showed over the petrol engine. At present prices, it was approximately 80 per cent. in actual saving in fuel costs. By volume it amounted to more than twice the miles per gallon, which meant that if the price per gallon was raised to the same price as petrol there would still be an enormous advantage. There was considerable economy in lubricating oil. Owing to the more perfect combustion there was little or no dilution of the crank-case oil, which tended to longer life of pistons and rings, and less wear on the cylinder walls, which meant lower depreciation costs and overhaul expenses.

In pulling power, the Diesel engine with its extraordinary high torque at low speeds was far superior to the petrol engine. One could say that it was easily one gear better. The new Leeds omnibus was turned round in a wide street on top gear at some two miles per hour without a shudder. It is the author's opinion that this heavy torque should be taken into consideration when designing chassis for Diesel engines, and a somewhat heavier transmission line employed than is the case with those of petrol engines. The Diesel was economical on fuel at partial loads, whereas the petrol engine was not. Considering that a road vehicle was only working at full load for a small part of its life, that point was of great importance.

The Diesel engine must be heavier and longer than the petrol engine of to-day, power for power, and seating capacity and loading platforms must be made to allow for this, and the chassis designed accordingly. Possibly the Ministry might be induced to consider the need for allowing somewhat heavier axle weights when Diesel transport increased to any extent. Meantime, and during the period of transition, users must put up with heavier engines, in return for the great advantages they would reap from the oil engine. Major Goddard paid a high tribute to the German engineers who first tackled the difficult problem, and to whom was due the fact that this engine was well on the way to oust the petrol engine.

* This vehicle was described and illustrated in "The Tramway and Railway World" of March 13, 1930.

## A MANCHESTER REFUELLING TANK.

The accompanying illustration depicts an arrangement devised by the Manchester Transport Department for re-fuelling omnibuses at the termini of long-distance routes, as, owing to the mileage worked per day on such services, it is not found practicable to carry sufficient petrol for the day's requirements.

The vehicle, which complies with the regulations of the Explosives Act for the conveyance and storage of petrol, comprises a spirit tank of 250 gallons capacity, and various accessories mounted on a 30-cwt. Ford chassis in such a manner as to enable the tank to be removed in one unit from the chassis in the event of the latter needing repairs. The tank has an elliptical section 3 ft. 9 in. wide by 2 ft. 6 in. deep, the length of the tank being 5 ft. 6 in. The rear of the tank barrel projects 2 ft. 6 in. beyond the tank proper, in order to form a cover for the pump, which, together with its gearing, is thus enclosed when travelling. Dished doors with convenient fastenings are provided to cover this compartment.

Refuelling tank for long-distance omnibuses.

Fitted to the tank are a transverse baffle-plate and steel manhole 16 in. in diameter, together with lid, pipes and fittings to conform with the regulations. Outlet fittings comprise a spring-loaded foot-valve, operating from the lid, and the necessary piping and connections to the pump. In the rear compartment of the tank already described is a 5-gallon piston-type measuring pump with delivery hose, swing-arm and piping, the end of the delivery hose being fitted with a quick cut-off nozzle of the non-leak pattern.

The body has a driver's cab, behind which is a metal fire-screen, and both tank and body are painted and lettered in accordance with Manchester Corporation practice.

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# OMNIBUS AND COACH SECTION

## PUBLIC PASSENGER-CARRYING VEHICLES.

A Paper by Mr. Geo. J. Shave, Chief Engineer and Operating Manager of the L.G.O.C.

An interesting paper entitled "Passenger-Carrying Vehicles" was read at meetings of the Institution of Automobile Engineers, held in London on November 10, and in Coventry on the following day, by Mr. George J. Shave, chief engineer and operating manager of the London General Omnibus Company. The first meeting was a joint one with the Institute of Transport and the Commercial Motor Users' Association. A summary of the paper is appended.

The problem now exercising the minds of principals of transport undertakings, said the author, involved an answer to the following question: "What is to be the omnibus or coach of the future? Will the vehicles being operated to-day become obsolete before they have completed their useful life, or has the chassis reached such a point of efficiency that it can be said that, for at least four or five years, it will not be improved upon other than in minor details?" The modern trend was towards more exacting speed, acceleration, and braking conditions; the call was ever for increased engine output, and for such changes as must tend to a lessening of the proportion borne by the carried load to the total load. Such a lessening could only be checked by effecting economies in design to enable the stiffer and more powerful chassis to be lighter in proportion to its capabilities than the old one.

Body design aimed at making the proportion borne by the passenger load to the carried load as great as possible, and was influenced very largely by public requirements in the matter of comfort and safety. This proportion, like the other, tended to become less and less as more exacting conditions must be met in the provision of seating, shelter, ventilation, and lighting, and this lessening was to be checked likewise by economies in design.

The author placed passenger-carrying vehicles in six categories:—

(1) Six-wheel double-deck—as large a vehicle as can be built within the 30-ft. overall length regulation.
(2) Short six-wheel vehicle within the 27-ft. regulation.
(3) Four-wheel double-deck—as large as can be built within the 26-ft. regulation.
(4) Six-wheel single-deck vehicle within the 30-ft. regulation.
(5) Four-wheel single-deck vehicle within the 26-ft. regulation.
(6) Long-distance coach—four-wheel, within the 26-ft. regulation.

Normal seating capacity vehicles—50-60 seats double-deck, 36 seats single-deck—were probably the most economical to operate generally. They were more efficient than the larger vehicles for dealing with short-distance traffic which occasioned frequent stops for boarding and alighting. Mobility encouraged the growth of traffic, resulting in a better loading factor all day. During peak hours, services operated by these vehicles could be supplemented by additional vehicles to meet special traffics without interfering with the normal headways provided by the vehicles that operated all day. Suburban traffic generally flowed towards the shopping or congested centres, where the employment of these vehicles created less congestion than the larger vehicles.

Where conditions permitted, the centre of gravity in an omnibus should occupy a position even lower than that which gave the desired stability. Where the centre of gravity was high, braking was liable to promote skidding at corners and on cambered surfaces; rapid acceleration would give rise to the same tendency. It followed that faster schedules might be run with single-deck omnibuses having low centres of gravity than with double-deck omnibuses. Since the carried load in a modern omnibus formed the large proportion of the total weight, and since the carried load comprised very nearly everything above floor level, the problem of making further reductions in the height of the centre of gravity resolved itself simply into the problem of reducing the floor height. Very little could be hoped for in the matter of lowering this load as a whole. Double-deck body construction, dispensing with flat or slightly cambered decks and giving head room only where essential, did not provide the necessary seating accommodation having regard to the length and width. With the new vehicles of the London General Omnibus Co., with their very low centre of gravity, under the worst conditions—when the upper deck was laden and the lower deck was unladen—the body might be tilted to the extent of more than 30 degrees before overturning could occur.

With the advent of cross-seating, omnibus axle-weights became so great as to approach the limit tolerated by road authorities, and the need arose, as bigger omnibuses were required, for throwing a greater proportion of the weight forward. To this end, the forward drive omnibus was introduced. The drawbacks to the forward drive were the heaviness of steering consequent upon the increased front axle loading, and the difficulty of access to the engine on the offside. Neither of these drawbacks had proved serious.

In a reference to transmission problems, the author said that in addition to gear-changing on undulating roads, the stopping to set down and take up passengers also called for gear manipulation. With the very heavy omnibus used in services necessitating a great many stops, it had become impossible to achieve, without high maintenance costs, the propulsion of the load through the agency of the clutch and gearbox. The cone clutch, faced with leather or fabric, had been almost entirely superseded for town work by single- and multiple-plate clutches. In the matter of maintenance costs no one type was good enough to have become the widely-accepted standard in clutch practice. It was probably only a matter of a year or two before other forms of transmission would be discovered. For the right-angle drive in an omnibus rear axle, bevel and other forms of gearing had yet to be proved superior to worm gearing; so far the highly efficient reversible worm gearing was the best. The difficulties inherent in the many forms of bevel drive were to make them compact and also silent.

Adverting to the use of light metal for body building, the author remarked that practically two-thirds of the material used in the construction of the latest bodies for the L.G.O.C. comprised duralumin and aluminium. The sections must not be riveted or welded, but bolted to give a certain flexibility. This system was adopted by the General Motors Corporation in America for their new steel bodies.

Referring to the heavy-oil compression-ignition engine, Mr. Shave said that experiments had been carried out by the L.G.O.C. with various systems, which had given a very satisfactory performance, including double the mileage obtained from petrol. He suggested that every endeavour should be made to produce gas oil—a home-produced fuel—for these engines. Coal tars were definitely less suitable than were petroleum or shale oils.

In conclusion, Mr. Shave put forward the following suggestions for the omnibus of the future:—

"A chassis with as low a centre of gravity as possible, with final reduction of the worm type; a compression-ignition engine, having an idling speed of approximately 300 R.P.M., with a maximum speed say up to 2,500 revolutions; engine to develop not less than 100 H.P. at say 2,000 R.P.M.; to be fitted with some form of infinitely-variable gear, or, it may be, an electric transmission, as the Diesel engine in its present state can be used more satisfactorily with electric transmission, as a wide range of speeds is not necessary with this; four-wheel brakes of the assisted type. Driver to be placed in the forward position by the side of the engine. Body to be entirely constructed of metal—double-deck, and to be of the covered-top type, having a sunshine or sliding roof which can be operated easily and rapidly. (Up to date we have not been able to find a practical device of this character which will stand the strain of public service work.) Particular attention must be given to the comfort of seating, as undoubtedly the more comfortable a public-service vehicle is, the more traffic it will attract."

## BRITISH OMNIBUSES FOR CAIRO.

The first of a large consignment of British omnibuses is about to be shipped to Cairo for the Egyptian General Omnibus Co., Société Anonyme. This company has been formed under Egyptian law as a result of an important concession obtained by Commander F. T. Hare, managing director of the Overseas Motor Transport Co., Ltd., London, and John I. Thornycroft & Co., Ltd., to operate omnibus services in Cairo.

The chassis is the Thornycroft standard four-cylinder, but with left-hand drive, and the bodywork is by the Park Royal Coachworks, Ltd., London. It is a single-deck vehicle, divided into first and second class, the former compartment seating twelve and the latter fifteen. It contains several features for the special needs of Cairo, such as sun-blinds and extra ventilation, and the predominant outside colour is the green of the Egyptian national flag. At present 108 of these omnibuses are on order, and others are to follow. The new service comes into operation on February 1.

An illustrated description of the vehicle will appear in a later issue.

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# THE SCOTTISH MOTOR TRANSPORT EXHIBITION.

## NEW MODELS FOR PASSENGER AND GOODS SERVICES.

The 29th annual Scottish Motor Exhibition, held in the Kelvin Hall, Glasgow, from November 7 to 15, maintained its hold on the Scottish motoring public as well as upon the manufacturer and his agent. Not only was all available space in that great hall fully occupied by the stands of exhibitors, but the daily attendance showed the keen interest of the public in the developments that have been effected during the year. As there is no commercial vehicle exhibition in London this year, much greater interest was taken in the heavy section of the industry, and much more space was devoted to the display of public service passenger vehicles and to those designed for the transport of goods. A welcome advance on past practice was the placing in one section, of the stands—some 45 in number—upon which the commercial vehicles were exhibited. By this arrangement visitors were able to devote more time to the inspection of the particular models in which they were interested, and this in greater comfort. Evidence that competition is keen may be gathered from the fact that some 37 different makes of vehicles were displayed, 25 of these being entirely British. While in the main the development of the heavy commercial vehicle has been along orthodox lines, more than one exhibit indicated the possibilities of progress on new lines, both with regard to the generation of power and its transmission. As running and maintenance costs are equally as important as first cost, the development of the heavy oil engine, of which two samples were shown—will be carefully watched, while the demonstration of the pre-selective gearbox and the shockless transmission gives remarkable evidence of the progress that has been made towards perfection in the control of road vehicles.

Speaking broadly the display in the commercial vehicle section of the Scottish Exhibition showed that the developments have been mainly along the lines of efficiency in service. Thus we find lighter and faster vehicles for goods service, more powerful engines and better braking equipment in the passenger chassis, and a more careful consideration of the details which make for the care free running of these vehicles and the consequent increased reliability of the public services.

The fitting of six-cylinder engines even to comparatively small models for goods as well as passenger services was very noticeable, as was also the increasing tendency to add a forward control model to most of the ranges.

In the matter of body work many fine examples were shown, both in the form of the service omnibus and as luxury coaches. The growing popularity of the covered top double-deck omnibus may also be gauged by the considerable number shown, many of these having been built to order for delivery immediately after the close of the exhibition. A noticeable improvement in the upholstery of both the omnibuses and coaches was the use of leather in combination with moquette. The effect in many vehicles was pleasing, while from the maintenance point of view, the combination promotes economy, for all the parts of the seats and backs that are subjected to the hardest wear are leather covered while the main surfaces are upholstered in rich moquettes, the matching and toning of colours leaving little to be desired. Even in some of the double-deck omnibuses this combination of upholstery materials was used on both decks. The improvement in the finish, the fitting of drop windows and general appearances of the upper saloons was, indeed, a marked feature of the exhibits. Several ingenious emergency exits from the upper deck had been fitted, the one most favoured being at the front on the off-side of the driver. The heating of long-distance coaches has also received attention and a number of the vehicles were fitted with heating apparatus, mainly of the hot air variety. The number of convertible coaches exhibited indicates the growing popularity of this type of vehicle. Various types of movable roof were fitted from the sun-saloon to the spring-held canvass cover. All of these showed improvement on the earlier models and appeared to be remarkably efficient.

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The following is a brief description of the principal exhibits in the commercial vehicle section.

### NOTES ON COMMERCIAL VEHICLE EXHIBITS.

**Albion Motor Car Co., Ltd.**—Three of six exhibits were new types, two of which were omnibuses. One of the latter, the 20-seat "Victor," has a saloon body in which the upholstered semi-bucket seats accommodate three abreast, two on one side of the gangway and one on the other. This plan enables the body to be constructed on more attractive lines, and the longer wheelbase of 14 ft. 6 in. allows ample leg-room. The four-cylinder engine develops over 40 B.H.P., giving a good turn of speed and rapid acceleration.

Albion "Valkyrie" 32-Seat Service Omnibus.

The vehicle, which was built to order of the South of Scotland Motor Co., of Dumfries, has a front entrance and an emergency exit on the near side at the rear. A service-type omnibus was the other new model, its basis being the "Valkyrie" 32-seat chassis, fitted with a special saloon for W. Alexander & Sons, of Falkirk. This firm already has over one hundred Albion vehicles. The engine has four cylinders, with a bore and stroke of $4\frac{5}{16}$ in. by $5\frac{1}{4}$ in., affording adequate power for hilly districts, but being economical to operate. Other features are accessibility, ease of maintenance, a four-speed gearbox, four-wheel servo-assisted brakes, and the Albion system of grouped nipple lubrication. A second "Valkyrie," on a Manchester firm's stand, was supplied to the Midland Motor Services. A third omnibus on the Albion stand was the 36-90-H.P. six-cylinder "Viking," seating 32, and built for Muirhead (Glasgow), Ltd., for town-to-town service.

**Associated Equipment Co., Ltd.**—Three notable exhibits were headed by the "Regal" 95-H.P. six-cylinder coach, which was introduced at Olympia last year, and was described in this journal

A.E.C. "Regal" with 28-seat Body by Duple Bodies, Ltd.

of November 21, 1929. The "Regal" has since won a reputation as a machine for long-distance and limited-stop services. The model seen at Glasgow had a 28-seat body, by Duple Bodies & Motors, Ltd., of Hendon, London, N.W. This body is of exceptionally strong construction, and is insulated from what little vibration may pass the air tyres, the excellent springing and the shock absorbers. A further provision for comfort is the Walman

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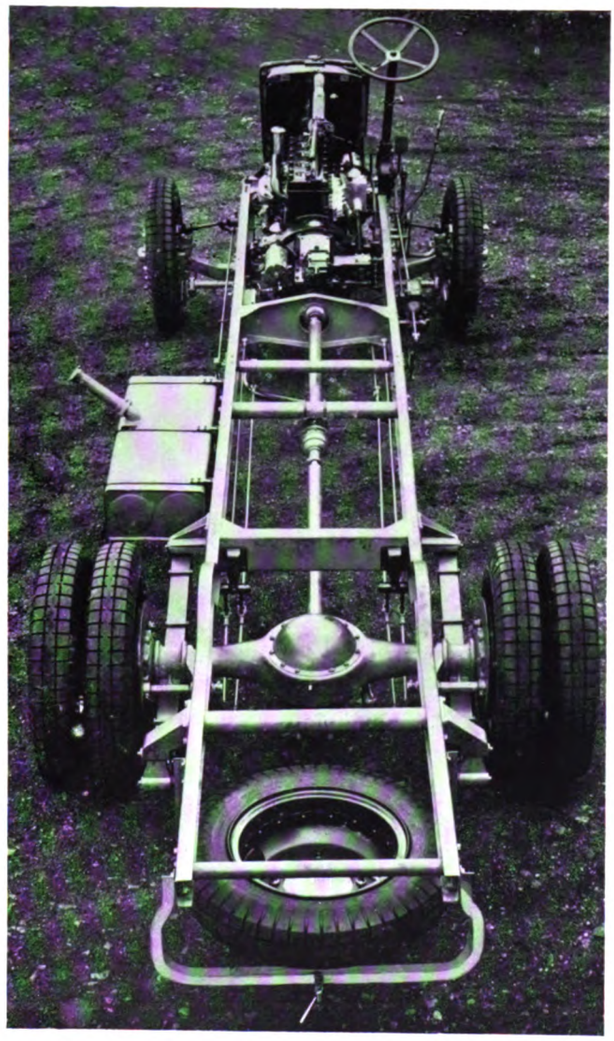
# OMNIBUS AND COACH SECTION

sliding head. Ventilation is by glass louvres over all drop windows. Electric lighting through specially designed fittings gives ample illumination for night travel. The seats are covered with moquette, and are provided with ash trays and match strikers. Easily reached parcel nets and bell pushes add to the passengers' comfort. The saloon has front and rear doors; the driver is housed in a half cab. Great interest was evinced in the A.E.C. six-cylinder engine for operating on heavy oil. Outside the exhibition there was a demonstration vehicle. The success of this development for omnibus and goods work was attested in an illustrated description which appeared in THE TRAMWAY & RAILWAY WORLD of November 13 last. The third exhibit was the 110-H.P. "Mammoth" flat platform lorry for 7- to 8-ton loads.

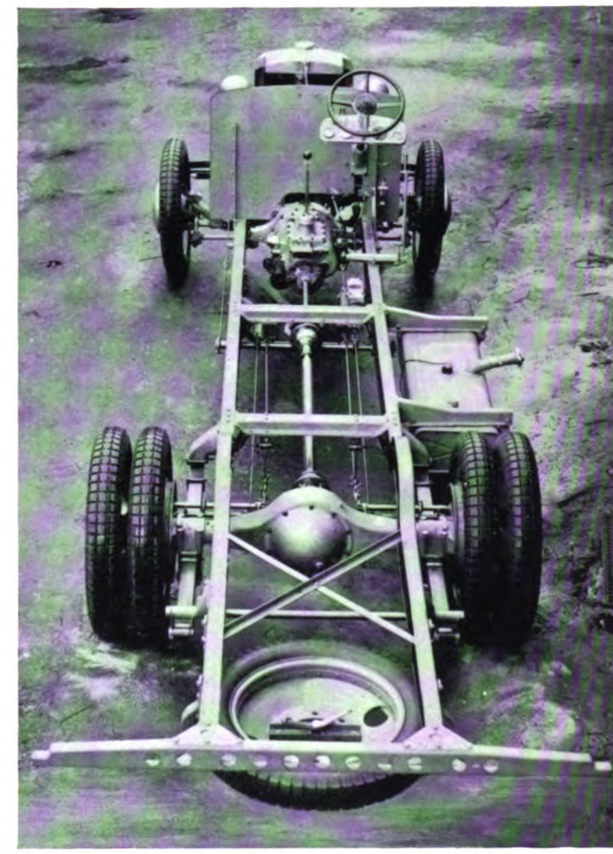
**Bean Cars, Ltd.**—The outstanding exhibit of the Bean factory was the new 26-seat passenger chassis which has been designed to meet the demand for an inexpensive omnibus or coach chassis suitable for a moderate load. The engine is of the monobloc type with four cylinders, 95 mm. by 130 mm., and detachable head. Its capacity is 3,685 c.c. and is rated at 22·3 H.P. There is an aluminium sump, four-point suspension, and the drop forged crankshaft of exceptional size is mounted in three white-metal



Bean Chassis for 26-seat Omnibus or Coach.

bronze-backed bearings of ample size. The forced-feed lubrication system is connected to an oil cooler incorporated in the radiator block. Aluminium alloy pistons of special design are fitted. Automatic lubrication to the camshaft is by means of oilways drilled in the crankcase. Four forward speeds are provided, the transmission being by divided propeller shaft to the under-driven worm-type back axle. Four-wheel brakes assisted by the Dewandre system, constant voltage dynamo, self starter, large petrol storage tank, and a low loading line, are a few of the features that clearly show that care has been taken to produce a chassis worthy of its place in the Bean range. Another new model was the 20-25-cwt. commercial chassis. This has a 4-cylinder engine developing 40 B.H.P. This model was shown fitted with a drop-sided lorry body. Examples of the Bean 40-45-cwt. chassis mounted with a special-type furniture van and the 30-cwt. chassis with an end-tipping body, completed a comprehensive exhibit.

**Commer Cars, Ltd.**—A 20-seat rear-entrance omnibus body and a luxury saloon coach body to seat 14 were shown on the well-



Commer Cars Six-cylinder "Invader" Chassis with silent third gear.

known 6 TK "Invader" chassis, which has a six-cylinder engine and the Commer silent third gear. The engine has been improved by the introduction of a re-designed piston, silchrome valves, and a larger-capacity oil pump. Dipping reflector head lamps, shock absorbers front and rear, and a 20-in. steering wheel are now standard fitments. A third exhibit was a G2 (40-50-cwt.) goods chassis with an end-tipping lorry body. The "Invader" chassis was also to be seen on Alex. Mather's stand with a 20-seat Sunsaloon coach body. On the stand of Charles Roberts & Co., Horbury Junction, Wakefield, was an "Avenger" chassis from the Commer Car Works. This had a 28-seat distinctive saloon body for long-distance work. All new Commer machines have a smart and deep radiator.

**Crossley Motors, Ltd.**—Five attractive exhibits showed something of the capabilities of the Gorton Works at Manchester. Pride of place was taken by the 52-seat top-covered omnibus with the "Condor" chassis, painted in the Aberdeen Corporation colours, it being one of an order from that municipality. The staircase is enclosed, and there is an emergency exit from the top deck. The six-cylinder engine is of 38-110 H.P., with magneto ignition, four-speed gearbox, single-plate clutch, right-hand change, water

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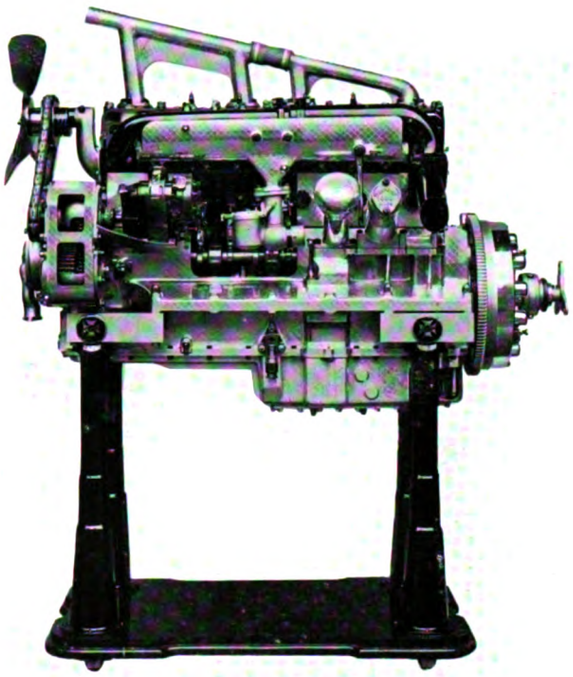
# OMNIBUS AND COACH SECTION

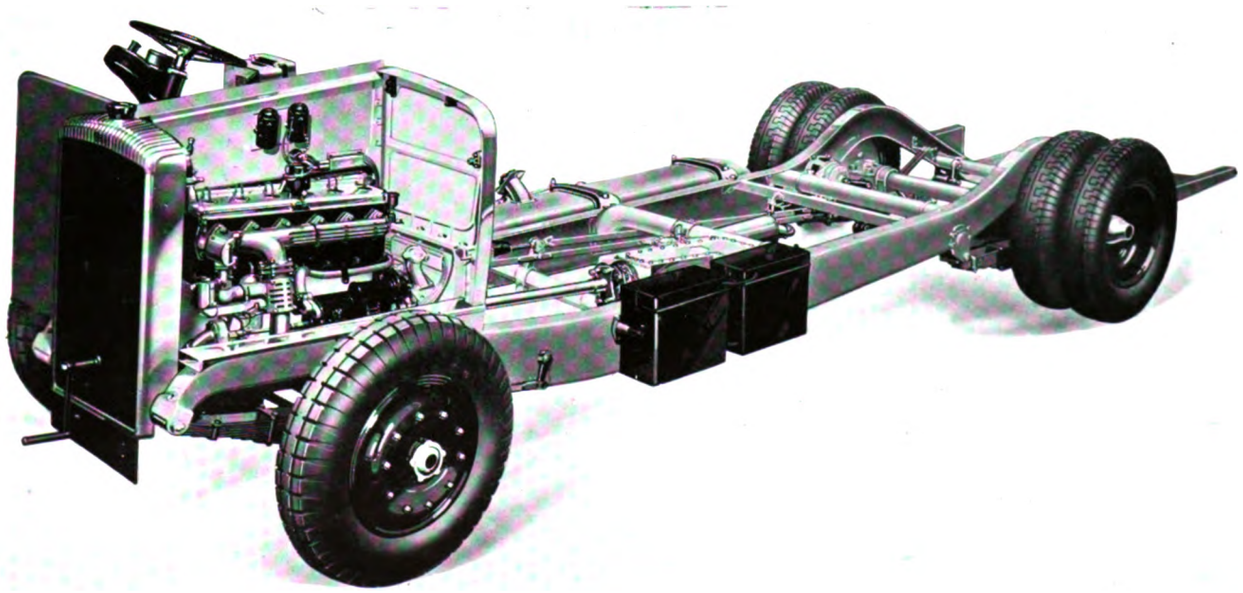
and oil circulation by pump, and autovac petrol feed. The rear axle is of the full floating design with under-driven worm, the differential being of the bevel type. The frame is dropped at the rear to give a low platform. Four-wheel brakes are operated by



Crossley 38-110 H.P. Six-cylinder Sectioned Engine.

foot pedal and servo attachment, the hand brake working a separate set of shoes on the rear axle. The attractive body is a Crossley production, this also being the case with the 32-seat service omnibus which was shown. This body has a front entrance and rear emergency door. The engine and "Arrow" chassis details are similar to those of the double-decker. Special cant-rail ventilation is provided. The "Arrow" chassis and the 38-110-H.P. six-cylinder engine is also utilised for a 33-seat coach built for the Norfolk Motor Services, Ltd., and having a Sunsaloon body by Sunsaloon Bodies, Ltd., of Birmingham. The body is truly a de luxe production. A bare chassis for single-deck vehicles and the sectioned Crossley engine completed the exhibits.

**The Daimler Company, Ltd.**—The exhibit of the Daimler Company included three passenger vehicles and a bare chassis. In each case the chassis was the Daimler CH.6 low loader fitted with the new Daimler transmission which was described in THE TRAMWAY & RAILWAY WORLD of November 13. The passenger vehicles were a double-deck omnibus with coachwork by Park Royal (Coachbuilders), Ltd., seating 49 passengers, a single-deck omnibus seating 30 passengers, and Sunsaloon coach seating 26 passengers, the bodies of both these being constructed by the Hoyal Body Corporation. The double-deck omnibus was an exceptionally fine example of this type of vehicle, and as the seating accommodation was limited to 49—24 on the lower deck and 25 on the upper—ample room between the seats was a special feature. In the lower saloon the seats were upholstered in figured moquette, and in the upper in leather. An emergency exit was provided at the rear of the top deck. The single-deck omnibus had a rear entrance with an emergency door on the offside front, and the saloon coach was constructed with two entrance doors on the near side with an emergency door on the off-side front. The new Daimler transmission as fitted to the low-loading omnibus chassis attracted much attention. This had the Daimler sleeve-valve six-cylinder engine, the bore and stroke being 97 mm. by 130 mm., with a seven-bearing crankshaft fitted with vibration damper. The new transmission system comprises the hydro-dynamic shockless transmission device, known as the Daimler fluid flywheel, a pre-selective, self-changing, silent, four-speed gearbox and a worm-driven rear axle. The fluid flywheel replaces the ordinary clutch; it has only two moving parts, and is entirely automatic in action. The drive is transmitted from the engine by means of the interchanges of energy in a rapidly moving fluid, with the result that the starting from rest and the "take-up" after gear-changing are much smoother than with any other known method of mechanical propulsion. Any gear, pre-selected by a small control lever mounted on the steering column, may be instantly and silently engaged merely by depressing and releasing a pedal. The cumulative effect of these characteristics is not only to provide a degree of silence, smoothness, and ease of operation greater than with any other type of petrol-driven car, but reduces driving fatigue to vanishing point.



Daimler Low-loading Chassis fitted with the New Transmission.

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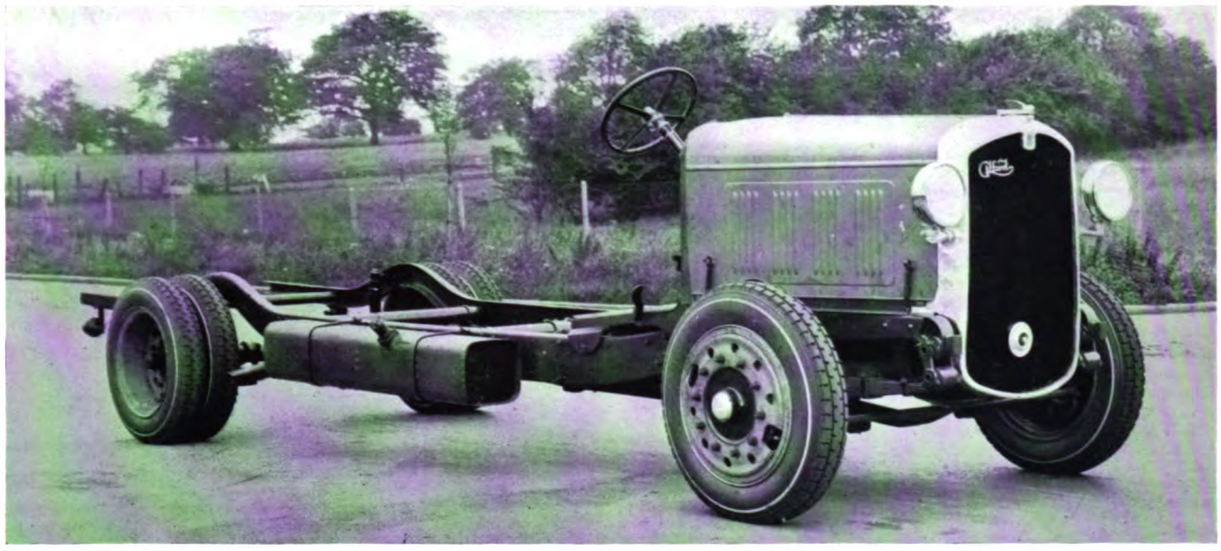
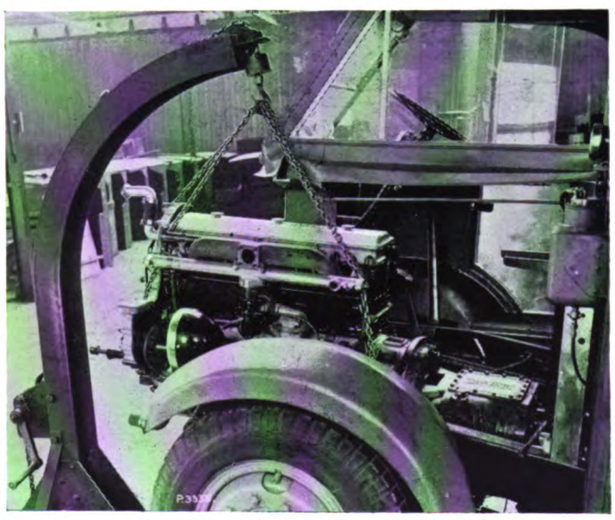
**Dennis Bros., Ltd.**—Two passenger and three goods exhibits were a centre of attraction. The former comprised the "Arrow" in chassis form, and also with a 28-seat saloon coach body by Duple Bodies and Motors, Ltd., London, N.W. This saloon is truly a de luxe production at a price little more than half the cost of the chassis. The engine develops from 43 to 100 H.P., and the feature of the chassis and body is the degree of comfort given to the passenger. This is increased by the six heavy-duty air tyres and the semi-elliptic springs, those on the rear axle being of the patent divided type. Front springs are supplemented by Gruss air-springs; the



Gilford Chassis with Six-cylinder 31-85 B.H.P. Engine for Long-Distance Coaches.

The "Arrow" has a six-cylinder engine of 100 mm. bore and 130 mm. stroke, and one of its features is the rocker-gear that can be moved aside to enable decarbonising to be done without interference with the timing. The three goods machines were seen for the first time at an exhibition. An 8-ton lorry chassis has an engine of six cylinders, developing 120 B.H.P. at 2,000 R.P.M. With forward control there is a body space of 20 ft. 4⅜ in., the wheel base being



Dennis "Lance" Detachable Crane for engine removal.

16 ft. 6 in. The frame height when loaded is 24 in. The 8-tonner has air tyres, as is also the case with the two other new commercial chassis. These also have forward control, one being for a 30-cwt. load, and the other carrying 2 tons.

**Gilford Motor Co., Ltd.**—The display of this company was on the stand of Mr. Peter Crerar, bodybuilder, of Crieff. A 32-seat service omnibus, on the 168 forward-control OT chassis, was one of a number ordered by Messrs. Currie & Thomson, of Airdrie. rear springs have Luvax rebound absorbers. Smoothly acting braking arrangements comprise the foot and servo-assisted four-wheel brake, worked in conjunction with the Gilford patent equaliser, and the hand brake which acts on the rear wheels. The brakes can be instantly adjusted. The gearbox gives four speeds forward and reverse. The fully floating rear axle is of the underslung worm type, the shafts and differential being withdrawable without jacking. The Crerar-built body has two doors. Its semi-bucket seats are upholstered in real leather. The means of ventilation are supplemented by Rawlings drop windows. A 20-seat

Six-cylinder Dennis "Arrow" with Duple 28-seat Body.

long-distance coach with Sunsaloon roof and two doors has a luxury body by Wycombe Motor Bodies, Ltd. Its AS6 chassis (which was also exhibited separately) has a six-cylinder engine of 31-85-B.H.P., which in conjunction with the balanced transmission, ensures absence of vibration. Extra-long springs and hydraulic dampers give riding comfort and freedom from rolling, while the extra-width frame adds to stability. This vehicle has gone to the Midland Bus Co., of Airdrie. The 168 OT chassis was also shown with a furniture-van body of exceptional proportions.

**Guy Motors, Ltd.**—Of three passenger vehicles exhibited, one is a new product—the "Victory"—a 20-seat model for use either

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# OMNIBUS AND COACH SECTION

as a service omnibus or as a long-distance coach. It has a six-cylinder engine of 24-65 H.P. A description of this exhibit, the chassis of which sells at £495, is given on another page of this issue. For the 48-51-seat double-deck omnibus, known as the "Invincible," there is a six-cylinder Guy engine of 58-105 H.P. Accessibility of the engine is all that can be desired in both the forward or behind-the-engine driving positions. With a totally enclosed

New Type Body on Guy "Conquest" Chassis.

body both decks are excellent examples of passenger-comfort, and externally the body has pleasing lines. This feature is aided by the dropped frame of the chassis, which gives a low-loading level. The wheelbase is 16 ft. 7 in. The four wheels carry 34 in. by 7 in. pneumatic tyres, twins in rear. Four-wheel servo-assisted brakes are fitted. Lighting and starting could not be better cared for than by the constant voltage set and battery installed by

Enclosed double-decker with Guy 58-105 H.P. Engine.

C. A. Vandervell & Co., Ltd., of Acton. A third six-cylinder engined vehicle is the "Conquest" omnibus seating 32. Chassis and lighting details are similar to those mentioned in the case of the "Invincible." A feature of the new type of body on the "Conquest" chassis is that the span of the roof is reduced owing to the pillars above the waist rail sloping sharply inwards. This arrangement reduces weight and cost, and gives clearance of trees, lamp-posts, etc.; while the recessed panels give increased internal width below the waist rail. Also shown was the 40-50-cwt. lorry, one of the seven "Guy" commercial models for loads of from 30 cwt. to 12 tons, all on air tyres.

**Halley Motors, Ltd.**—No less than seven exhibits, all of much interest, were displayed on the stand of this old-established Scottish firm. These included two passenger vehicles, four commercial machines, and the new Halley six-cylinder engine. The passenger models were the Halley "Chieftain" 26-seat Pullman coach and the "Conqueror" 36-seat rear-entrance omnibus. The chassis of the former has the 37·2-H.P. six-cylinder engine which is proving so successful for fast passenger services. The body was built by Thos. Harrington, Ltd., of Brighton, and is of the all-weather type fitted with a Walman sliding roof operated from the driver's cab. The 36-seat omnibus is of the service type with wide open rear entrance. It is mounted on the 4-cylinder "Conqueror" chassis, the engine of which is rated at 30 H.P. with cylinders

Halley "Chieftain" Pullman Coach.

$4\frac{3}{8}$ in. bore, 5 in. stroke. Four-speed gearboxes are fitted to each of these models. The new Halley six-cylinder engine has been designed for double-deck omnibus services; it has a bore of $4\frac{1}{4}$ in. with a stroke of 5 in. The cylinders are of the wet sleeve centrifugally cast type, deeply spigoted into the aluminium crankcase. There are seven bearings to the crankshaft, the journals and crank pins being $2\frac{1}{2}$ in. in diameter. The combustion chamber is of the Ricardo type with masked inlet valve. A noteworthy feature of the design of this new engine is the accessibility of all its parts. Much care and thought must have been expended to produce such results. An exhibit of special interest to municipal authorities was the Halley refuse-collecting vehicle. This had a low-loading chassis with hydraulic end-tipping gear.

**Leyland Motors, Ltd.**—Passenger vehicles shown included a "Tiger" 32-seat single-deck omnibus, which has been constructed for D. Lawson, Ltd., of Kirkintilloch, making the twenty-fourth order from this Scottish firm. The chassis is a TS.1 model, and is fitted with a standard front-entrance 32-seat saloon body. It has a wheelbase of 17 ft. 6 in. The seating, of the "Comfort" type, is upholstered in red hide and moquette, providing luxurious accommodation, and the coach is equipped with all the refinements which make road travel so comfortable nowadays. The colour scheme is rather unusual, and gives a most pleasing effect. The main panels are finished in lake with a red waist rail; window framing is in cream and the roof is black, while the mudguards are red and the wheels cream, edged with black. The vehicle is

32-seat Leyland Tiger with "Comfort" seating.

of smart appearance. A Leyland "Titan" 6-cylinder vehicle was also to be seen on the stand of F. D. Cowiesor & Co., of Glasgow, fitted with a 51-seat double-deck body of their manufacture. Leyland Motors also exhibited two commercial chassis, one the 6-7-ton heavy-goods "Bull" model and the other a 50-cwt. "Badger" for light-goods work.

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# OMNIBUS AND COACH SECTION

**Maudslay Motor Co., Ltd.**—Two vehicles were shown on the stand: a double-deck omnibus on the Maudslay "Majestic" chassis with bodywork by Ransomes, Sims & Jefferies, of Ipswich,

Maudslay "Majestic" 52-Seater with Ransomes Body.

and a handsome single-deck omnibus on the Maudslay "Meteor" chassis with bodywork by Duple Bodies, Ltd., of Hendon, London. The double-deck omnibus gave comfortable seating for 52 passengers —28 on the top deck and 24 in the lower saloon. All the seats on both decks were of the semi-bucket type and well upholstered in a combination of moquette and leather. The single-deck omnibus was arranged to seat 32 passengers, being the Duple Company's municipal type with double doors to the rear entrance and an emergency door on the offside front. All fittings are chromium plated and the interior roof was specially panelled in a pleasing design. The "Majestic" chassis is fitted with a six-cylinder engine with a bore and stroke of 110 mm. and 130 mm. respectively, developing 100 H.P. at 1,700 R.P.M. and rated at 45 H.P. The cylinder water-jackets and crankcase are a monobloc aluminium casting, with centrifugally cast-iron cylinder liners. The detachable heads are cast in two units of three. The combustion chamber is of the pocketless type, hemispherically machined, the sparking plugs being central with the pistons. There is a seven-bearing crankshaft. The engine is mounted in the frame on the three-point suspension principle, the engine, clutch, and gearbox forming the unit. The same engine is fitted to the "Meteor" single-deck omnibus chassis which is similar in general design and equipment. Both have four-speed gearboxes and worm-driven back axles. Four-wheel brakes, Dewandre servo assisted, are common to both. The wheelbase

New 32-Seat Morris-Commercial Omnibus.

of the "Majestic" is 16 ft. 6 in. with an overall length of 26 ft., while the "Meteor" has a wheelbase of 17 ft. 6 in. and an overall length of 27 ft.

**Morris Commercial Cars, Ltd.**—With their light vehicles for public passenger transport and their range of business and industrial vehicles, this company is well on the way to secure popularity as keen as that which has been attained by the famous Morris private cars manufactured at Oxford. "Morris Commercial" models are produced at Soho, Birmingham, and they found places on four stands at the Exhibition. The well-known "Dictator" forward controlled 32-seat omnibus was on the stand of A. and D. Fraser, of Glasgow. Attention may be directed to the ease with which the 110 H.P. six-cylinder engine, clutch and gear-box can be detached as one unit from the chassis. This is accomplished without the use of a crane or special tools, and without disturbing any other parts. Only the standard tool kit issued with the vehicle has to be used. Another feature is that the cylinder head can be removed without disturbing the valve setting. The "Dictator" figured among six Morris machines on the stand of the Westfield Autocar Co., of Edinburgh. Other recommendations for it are that it has four-wheel brakes, servo assisted, and hand brake on the rear wheels, C.A.V. 12-volt starting and lighting set, four-speed gear-box, dry plate clutch, Luvax hydraulic shock absorbers, and chassis lubrication by grouped nipples. This "Dictator" coach is to the order of Edinburgh Corporation Transport Dept., and is fitted as a 24-seat luxury vehicle with sunshine roof. Morris-Commercial trucks and vans shown on the several stands ranged from the 8-cwt. light van to the 2½-ton truck, all at remarkable prices.

**Reo Motors (Britain), Ltd.**—The range of four exhibits on the stand of John C. Todd, the Glasgow agent for Reo chassis, were all fitted with the new Reo "Gold Crown" six-cylinder engine. This is rated at 27·34 H.P. and develops 67 H.P. at 2,800 R.P.M., the bore and stroke being 3⅜ in. by 5 in. It is an "L" head power unit with seven-bearing crankshaft, the cylinder block being cast in chrome nickel alloy and the pistons of low-expansion sapphire

Reo Service Omnibus for 26 Passengers.

hard alloy. There is a full-pressure lubrication system with oil purifier and gear-type oil pump. Four-speed transmission with selective change, semi-floating back axle and spiral bevel drive is provided on the "FF" or 2-ton model. On the "GA" or 3½-ton chassis the same engine is mounted but with a fuel pump. The framing is of heavier section, there is a fully floating back axle, while a heavy-duty gear-box is provided with a power take-off. Hydraulic four-wheel brakes are common to both models. Two passenger vehicles were shown, a 20-seat all-weather coach on the smaller chassis and a 26-seat service omnibus on the "GA" model. In both vehicles there was a full omnibus electrical equipment with large generators and batteries. In the larger model, the frame was of the low-loading design and fitted with automatically oiled two-stage rear springs for easy riding. The body, which was built by H. E. Taylor & Co., Ltd., of Norwich, is well designed for comfort and convenience, and is exceptionally smart in appearance. Two Reo machines were also shown on the stand of the Bass Rock Motor Co., Ltd., the Edinburgh distributors of the Reo chassis.

**Charles Roberts & Co., Ltd.**—This company lately added commercial motor body construction to the building of railway rolling stock in their great Works at Horbury Junction, near Wakefield. Two types of their public passenger body were exhibited, and apparently nothing better could be desired as regards design, appearance and quality of work. The "Horbury" type of long-distance saloon fitted to an "Avenger" 28-seat coach, designed

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# OMNIBUS AND COACH SECTION

with the object of rendering the complete vehicle distinctive to the Commer Company, fully achieves that purpose. Strength and lightness are combined in the body, which has a bottom frame of oak, reinforced with mild-steel flitch plates. Pillars and general framing are of prime, dry ash, mild-steel and gusset plates being fitted where necessary. The full domed roof, the exterior side and rear domes are of aluminium sheet. The centre portion of the roof is of plywood, the edges moulded with convex aluminium. The interior roof is lined with maple plywood, the centre portion being polished and the side domes enamelled white. Exterior side panels are of aluminium, the joints being covered with convex aluminium moulding. Careful thought is apparent in the arrangement of the driver's cab, the screen and all other glass being non-splinterable. The exterior painting is in the best coach style. The saloon provides the utmost comfort. Entrance is by a sliding door on the near-side front. Emergency exits on the off-side front

A Distinctive Service Omnibus Body by Charles Roberts & Co. on Commer "Avenger" Chassis.

and in the rear may be opened from inside and outside. There are large lockers in the lower skirt panels and a luggage rail is fitted on top of the rear dome. Though less elaborate, the "Calder" type of single-deck service omnibus body for 32 passengers, shown on the A. J. Stevens OT4 chassis, is a most pleasing production, designed with special regard to strength and lightness.

**Sunbeam Motor Co., Ltd.**—Noticeable on the stand of the Peebles Motor Co., their Edinburgh agents, were three Sunbeam exhibits. The S.M.C. "Pathan" 52-120 B.H.P. six-cylinder engine and four-wheel chassis carried a 32-seat semi-de luxe omnibus body. The power unit is the well-known Sunbeam engine with overhead valves, the cylinders having 100 mm. bore by 140 mm. stroke. The highly efficient C.A.V. lighting and starting set is utilised. Steering is the Marles V2 type, and the mechanical brakes are servo-assisted. This vehicle has the advantage of a low-loading frame. Two examples of the S.M.C. "Sikh" six-wheel chassis are for double-deck covered top bodies, accommodating 67 and 58 seated passengers respectively. Each chassis has the Sunbeam overhead valve engine with a bore larger by 10 mm. than that of the "Pathan." Rated at 45 H.P., the engine develops 70 B.H.P. at 1,000 R.P.M., and 142 B.H.P. at 2,400 R.P.M. One of the "Sikh" chassis has an overall length of 29 ft., and a wheel base of 18 ft. 6 in. The other is 27 ft. 4½ in. long, its wheel base being 17 ft. Each has C.A.V. lighting and starting and hydraulic braking of the Lockheed compensated type on all wheels.

**John I. Thornycroft & Co., Ltd.**—A 52-seat double-deck omnibus was staged, mounted on the latest type BC forward-control chassis.

Six-cylinder Thornycroft 52-Seater.

This vehicle is of special interest to municipal operators, as it has been constructed to meet the demands of municipal management as well as passenger requirements. It has a six-cylinder engine with R.A.C. rating of 40·8 H.P. The lower saloon has seating for 24 passengers and there is accommodation for 28 in the upper saloon, both being heated by the MacGregor thermo-economic outfit. There are three emergency exits, one being provided by a large opening window in the rear of the vehicle. It has a low-loading platform, with covered-in stairway, wide enough for two persons. The upholstery and interior fittings are practical and provide the greatest possible comfort and convenience, while the coachwork, by F. D. Cowieson & Co., has been designed to facilitate cleaning. It is a very impressive vehicle, and the one shown on the stand is the twelfth repeat order from the Aberdeen Corporation. Another exhibit was the 6-ton platform lorry on JJ forward chassis on pneumatic tyres. A feature of this model is a new, smart, totally enclosed driver's cab with drop windows. The Thornycroft new type A7 pneumatic-tyred 2½-ton lorry was shown with an improved type of driver's cab. Both lorries have a lower loading height than hitherto. The three exhibits provided excellent examples of the company's wide range of vehicles suitable for passenger, commercial and municipal transport.

**T.S. Motors, Ltd.**—Two examples of the output of this firm were staged, one being a complete 32-seat omnibus on the well known "Express" chassis, and the other a petrol-electric chassis designed

For town or long-distance service—The S.M.C. "Pathan."

"Express" 32-Seater by T. S. Motors, Ltd.

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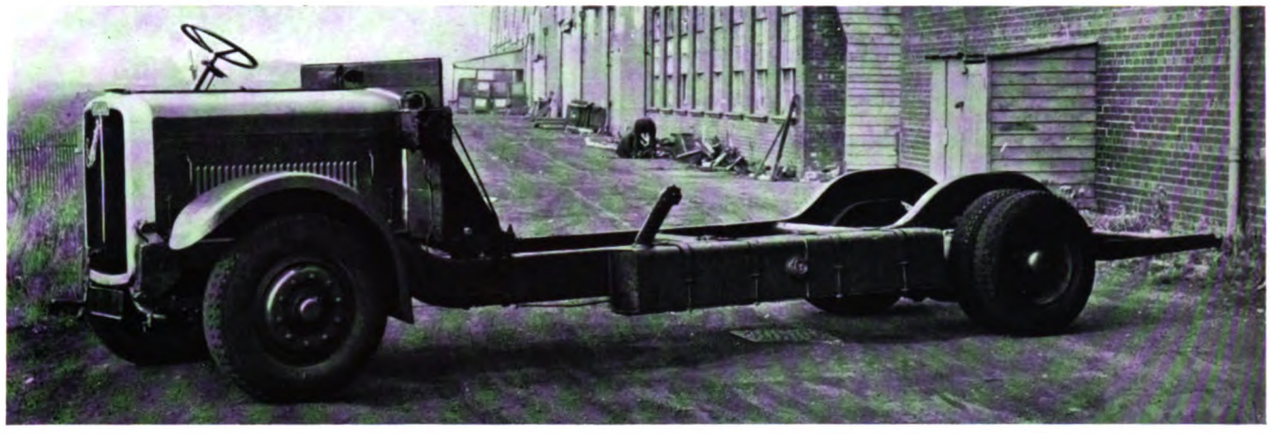
# OMNIBUS AND COACH SECTION

for operation either as a trolleybus taking current from overhead wires, or as a free omnibus with the electric motor driven by the petrol engine, details of which are given on another page. The T.S. Express chassis is deservedly popular in Scotland, a large number being in regular service. The chief points in its favour are the low operating and maintenance costs. The vehicle shown was mounted on the forward-steering type, known as the B.10.A.2 chassis. The four-cylinder engine is rated at 29 H.P., with cylinders 44¼ in. bore and 5 in. stroke. The gear-box gives four forward speeds, the final drive being of the worm type. Four-wheel brakes are fitted, these are servo-operated. The wheelbase is 16 ft. with a track of 6 ft. 2⅞ in. for the front wheels and 5 ft. 10½ in. for the rear. The total chassis weight being 3 tons 10 cwts. The single-deck 32-seat body was built by Messrs. F. D. Cowieson, St. Rollox, Glasgow. This was a handsome convertible saloon coach designed for long-distance service. The flexible roof was held in position by spring clips, which could be easily released and the vehicle converted into an open coach. The entrance is at the front by means of a folding door, an emergency door being fitted at the rear. All seats face forward, except a single seat over each wheel arch. These are well upholstered in a combination of moquette and leather, and are exceptionally comfortable. Amongst the special features worthy of notice are the hot-air heating apparatus, the excellent lighting arrangements and the large continuous luggage racks on each side of the vehicle. Rawlings drop windows are fitted. The vehicle shown is one of a number on order for a Glasgow operator.



"Emperor" chassis with 45-137 H.P. Engine for Vulcan Double-Deck Omnibuses.

The Vulcan "Emperor" for Glasgow.

**The Vulcan Motor and Engineering Co. (1906), Ltd.**—Prominent on the stand of the company was the "Emperor" double-deck omnibus chassis. This is fitted with the Vulcan "Monarch" six-cylinder engine, which has a bore and stroke of 110 by 130 mm. and a capacity of 7·4 litres. The R.A.C. rating is 45 H.P., and the B.H.P. is 137 at 2,800 R.P.M. The cylinders are cast in two blocks of three with detachable heads, the blocks and heads being interchangeable. Engine lubrication is by forced feed, positive and automatic, and chassis lubrication is by the grouped battery system. A single dry plate clutch and four-speed gearbox are mounted as a combined unit with the engine. Other components include 17-in. diameter brake drums on front and rear wheels, operated by vacuum servo, and a 50-gallon petrol tank with gauge. The wheelbase is 16 ft. 6 in., and the overall length 25 ft. 8¾ in., the unladen weight being approximately 75 cwt. It may be mentioned that a smaller type of the engine, rated at 37·2 H.P., is fitted in the "Prince" 32-seat omnibus chassis. Besides the passenger vehicle, the Vulcan Company had three commercial vehicles, a 30-35-cwt. normal-control hand screw tipper, a 40-45-cwt. forward-control detachable-sided lorry, and the 50-60-cwt. forward-control detachable-sided lorry. The four exhibits formed a fine display of the company's wide range of productions.

## WEYMANN BODIES.

### Important Developments.

Weymann's Motor Bodies (1925), Ltd., whose special type of fabric-covered motor bodies has earned a world-wide reputation for its many excellent qualities, has decided to extend the company's business into the omnibus and coach section of the trade. They are already producing these vehicles built with the usual coachwork, as well as with the Weymann patent system of construction.

A representative of The Tramway and Railway World was recently given an opportunity of inspecting the company's extensive works at Addlestone, Surrey, and was impressed with the extent of the shops and their suitability for the production of double and single deck omnibuses under admirable conditions. The whole floor area of the erecting shop and mill is under one roof, with wide galleries in which the trimming, cabinet work and subsidiary operations are carried on. The paint shop is an entirely separate building completely equipped for cellulose finishing, as well as for paint and varnish.

Among the orders now going through the shops are twenty-five bodies for Green Line Coaches, Ltd. These are being built to the company's own specification. There are also a number of handsome coaches similar to those now in operation on the London-Newcastle service. These are of the luxury type, and are being constructed to Weymann's own panelled design.

Messrs. Weymann have set themselves to produce both single- and double-deck omnibuses, as well as coaches of the highest quality and sound engineering construction. The experience of the firm in high-class coachwork will ensure that the finish, both in regard to paint-work and trimming, will be of the best, while the excellent facilities available will ensure prompt delivery.

Messrs. Weymann welcome their clients' own designs, to which they will carefully work. They are also prepared to submit the latest designs prepared by their own skilled staff.

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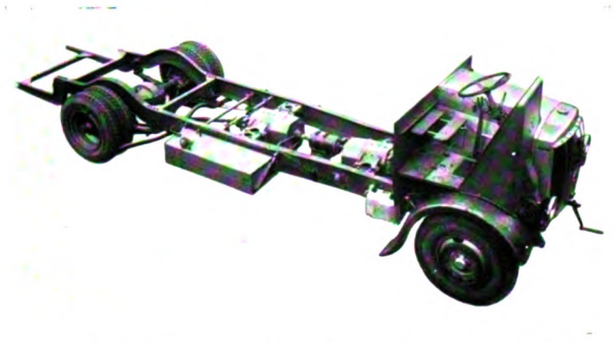
# OMNIBUS AND COACH SECTION

## PETROL-ELECTRIC TROLLEYBUS.

A Combination Vehicle for Operation either With or Without Overhead Wires.

A vehicle of special interest to operators of trolleybus systems is the new dual-capacity chassis which is the latest product of T. S. Motors, Ltd., of Maidstone. Designed to run either as a trolleybus, taking current from overhead wires or as a petrol-electric omnibus beyond the overhead wire system, it offers great advantages over the route-tied vehicle, and should be of value for



T.S. Motor Light-Weight Petrol-Electric Chassis.

the purpose of testing the traffic on prospective routes. Another important sphere of usefulness would be as a connecting link between existing trolleybus routes, while the facilities for a quick change-over of system would be highly appreciated when used for the purpose of keeping a service running in the case of the fall of trolley wires or the failure of current. In towns of historic interest where overhead wires are excluded from certain sections of the town, new traffic developments are made possible in conjunction with the trolleybus system, while still retaining the cheap running costs of the latter for the major portion of the route.

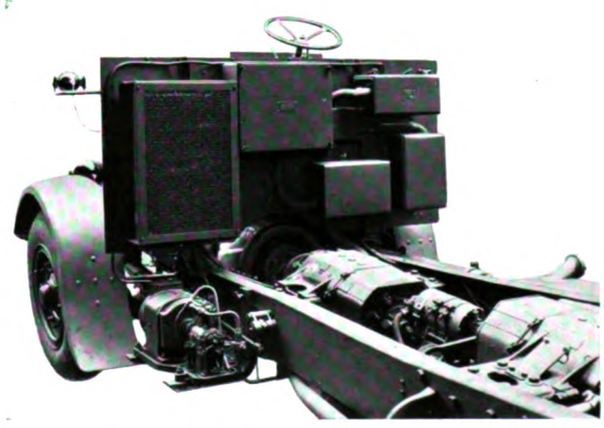
View of Controls.—Note change-over Lever protruding through Dashboard.

The basis of this machine, which was seen for the first time at the Scottish Motor Exhibition in Glasgow, is the low-built light-weight petrol-electric chassis which T.S. Motors produced in the early part of last year for double-deck omnibus service, and was fully described in the Tramway and Railway World, June 13, 1929. This is arranged with a forward control position and has a wheel base of 16 ft. The "T. S." standard engine for this chassis has four cylinders $4\frac{3}{4}$ in. by 6 in. bore and stroke, and is rated at 36·15. Where, however, the dual-purpose machine would only be required to run for short distances, or on level grades, as a petrol-electric vehicle, a smaller engine would be fitted, thus giving greater economy and reduction of weight. The controlling gear is now placed immediately behind the engine, mounted on the back of the dashboard. The master controller is foot-operated. This pedal and that connected with the braking system are used when working as a trolleybus, and accelerator and brake pedals only when running on the petrol-electric system. It is worthy of note that only two pedals are in use whichever system is in operation.

The electrical equipment is suitably wound to enable the motor to be driven either by current taken direct from the overhead wire or the engine driven dynamo. The change-over controller has four positions—one for running as a trolleybus, the second for starting up the engine, third for running as a petrol-electric omnibus, and a neutral position. Reversing is effected when the machine is running as a petrol-electric vehicle, a lever fitted with a safety catch being placed on the off side of the steering column controlling this movement. The foot-operated master controller and the main dynamo are cut out when the vehicle is required to run as a petrol-electric omnibus by the movement of the change-over lever to the necessary position, and the accelerator is isolated in the same manner when functioning as a trolleybus.

Servo-assisted four-wheel brakes are provided. When running as a trolleybus a separate electric motor operates an exhauster, which creates the suction necessary for the servo system to function. When running as a petrol-electric omnibus the engine provides the suction through the induction pipe in the normal manner. The change-over from one system to the other is entirely automatic. The lighting of the vehicle is provided for by a separate C.A.V. dynamo of the constant voltage type; this is mounted between the main electric transmission units and is driven through a flexible coupling from the armature of the motor.

The new T.S. model, although capable of taking a double-deck body seating 52 passengers, owing to the weight restrictions is limited to single-deck service in this country. The chassis is of a thoroughly up-to-date low-loading type, remarkably easy to operate, and provides the highest degree of riding comfort for passenger services. When loaded the height of the frame from the ground is 2 ft., the overall length 25 ft. 6 in., and the overall width 7 ft. The front wheel track is 6 ft. 1 in., and the rear 5 ft. 9 in. The engine develops 95 B.H.P. at 2,000 R.P.M., and is mounted on a sub-frame secured to the latter by spring loaded bolts. It is also equipped with spring loaded torqued damping device, and there is



Back of Dashboard showing arrangement of Controller of Car and Exhauster for Brake operation.

a remarkable freedom from vibration as a consequence of this method of mounting.

The main electric transmission units are of the latest T.S. octagonal yoke type. They are mounted on steel brackets in such a manner that a straight line drive is given from the engine to the under-driven worm-type back axle. The dynamo is coupled directly to the engine by a short tubular shaft, fitted at either end with a large, flexible disc universal joint. From the motor the drive is taken by a propeller-shaft fitted with Hardy-Spicer joints. The rear springs take the driving and torque stresses. Timken taper roller bearings are fitted to all four road wheels. The front tyres are 36 in. by 8 in., and the twin rear tyres are 34 in. by 7 in.

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# OMNIBUS AND COACH SECTION

## A.E.C. MOTORS FOR OVERSEAS.

AN EXHIBITION AT THE WORKS AT SOUTHALL.

That there is a widespread demand for appropriate British commercial and public passenger motor vehicles in various parts of the world, was shown by the attendance on November 28, at an exhibition of the latest models for overseas work which was held at the Southall (Middlesex) Works of the Associated Equipment Co., Ltd. For the most part the visitors were from the various Dominion Offices and Consulates in London. Although in a very full sense the machines "spoke for themselves," the visitors also had the advantage of having them described by the company's technical officers. They learned that the exhibition was the outcome of investigations which A.E.C. representatives from England have carried out in foreign countries and in the British Dominions during the past two years. This tour of the world was for the purpose of evolving types of British machines that will make an appeal in the highly competitive overseas markets. One had only to inspect the models to feel safe in predicting that they will meet with a highly gratifying reception. It is important to note, too, that most complete service after sales arrangements have been made, the company having as representatives abroad fully qualified engineers, conversant with British works practice.

Machines staged at Southall were as follows:—

"Ranger" 110-H.P. single-deck omnibus or coach chassis.

"Mercury" 3½-ton goods vehicle.

"Majestic" 6-ton freighter for city or country work.

"Aclo" front-wheel drive, four or six wheels, for traversing ground impassable to the orthodox four-wheeler.

A.E.C. high-speed oil engine for the propulsion of road or cross-country vehicles at a cost far below that of a petrol engine.

The title "Aclo" should be prefixed to each of the above-mentioned vehicles. It is the trade-mark under which A.E.C. products are marketed in South America and Germany. Each goods chassis has a high frame, rendering it suitable for overseas use. Descriptions are given below of each of the exhibits.

ACLO "RANGER" SINGLE-DECK OMNIBUS CHASSIS.

This speedy and powerful machine can be fitted either with a single-deck omnibus or a coach body to accommodate 26 passengers. It has proved its worth at home since its quiet introduction last year. Variations from home standards incorporated in the chassis are right or left-hand steering, deep robust colonial-type frame, heavy springing, a 19 ft. wheelbase, 29 ft. overall length, and special pneumatic 38 in. by 9 in. tyres. The six-cylinder engine has been developed from the experience gained in the popular "Reliance" and "Regal" chassis. Rated at 45 H.P., it develops, with an economical road setting, 58 B.H.P. at 1,000 R.P.M., and acceleration is smooth and steady right up to the maximum output of 110 B.H.P. at 2,500 R.P.M. The engine's characteristics are clean simple design, light weight, robust construction and ease of access to all parts. Outstanding features are the stout and rigid seven-bearing crankshaft, the large-diameter clutch (total wearing surface 380 sq. in.), the unit constructed gearbox with short rigid shafts, automatically adjusted timing chains, and throttle-controlled forced lubrication. The rear axle casing is off-centred to reduce the floor height of the body, the axle shaft is of the semi-floating type, and the shafts are of 100-ton high-tensile steel. Twin servo brake equipment ensures safe and effective braking at all speeds. The front axle allows over 45 deg. steering lock. The light steering gives perfect ease of control. The turning circle is 60 ft. on the right, and 80 ft. on the left. Lubrication of the chassis is from two batteries of nipples. There is a C.A.V. 12-volt electric lighting equipment. Height of frame loaded is 1 ft. 9½ in., and the clearance under the rear axle is 7½ in. Weight of the chassis 3 tons 3 cwt.

ACLO "MERCURY" FREIGHT CHASSIS.

A notable advance in goods chassis construction is to be seen in this machine. In general performance, high speed, and easy control, perfect springing and quietness in operation, it embodies the features of touring car and coach practice. Further, it has a large overload capacity, and great durability and accessibility. Adapted as a passenger vehicle, it has given striking performances during the past year in Great Britain, and easily accomplishes speeds of 30 to 40 M.P.H. The lively four-cylinder engine is rated at 31.1 H.P., develops 65 B.H.P. at 2,000 R.P.M. Its features are exactly the same as those of the "Ranger." It is equipped with a special track of 1,600 m.m.—the width of the bullock cart track—enabling it to be operated over dirt roads such as those of the Argentine camp districts. The 1,600-m.m. track is invaluable for keeping the vehicle in the ruts made by bullock carts. Other features are a steering damper to reduce vibration in steering, a K.P. governor, heavy-type back axle, colonial-type springs, and 30 in. by 7 in. front and 12 in. single rear tyres. The advantage of using a large-section tyre at the rear is that it increases the tractive effort of the chassis, and enables it to be operated under very adverse conditions.

ACLO "MAJESTIC."

This is a popular driver-behind-engine 6-ton freighter, well suited to overseas conditions. The engine, rated at 45 H.P., and developing 110 B.H.P. at 2,500 R.P.M., is similar to that of the "Ranger" mentioned above. The "Majestic" is designed principally for operation in cities and towns over cobble or tar-macadam roads, but it can also be widely used on camp "roads" during the dry season.

ACLO-HARDY FRONT-WHEEL DRIVE 4-TONNER.

This "go anywhere" front-wheel-drive wagon is the outcome of the alliance of Hardy Motors, of 46, Charing Cross, S.W.1. with the A.E.C. These vehicles are made with either four or six wheels, and they are in great request for military and overseas work. Possessing the power unit of the A.E.C. "Mercury" freighter, they have the outstanding advantage of the front wheels being engaged at will and made self-propelling. This enables them to be driven over ground impassable to the orthodox four-wheeler. The auxiliary gear-box provides ratios of 1 : 1 and 1 : 1.86, the two-wheel drive being on top ratio and the four-wheel drive on low. The front axle is of the fully floating type and the rear axle of the semi-floating type. Independent hand and foot brakes are provided, the latter being assisted by the vacuum servo system. Pressed nickel steel is used for the frame. The tyre equipment is 38 in. by 9 in. single pneumatics on all wheels. A towing attachment and a power take-off are fitted.

A.E.C. HIGH-SPEED OIL ENGINE.

As full particulars of this engine were given in THE TRAMWAY AND RAILWAY WORLD of November 13, the details of its development by the Associated Equipment Co. need not be repeated. For overseas operation the engine has two outstanding advantages. It gives nearly twice as many miles to the gallon as the petrol unit. It consumes oil which, a third of the cost of petrol in Great Britain, is relatively cheaper still in foreign inland towns.

## NEW DUAL AIR COMPRESSOR UNIT.

An entirely new automatically controlled air unit, providing air pressure for either spray painting or tyre inflation has just been introduced for garage service by B.E.N. Patents, Ltd., of 92, Tottenham Court Road, London, W.1. The recent introduction by the company of a new fan spray paint gun, requiring a much smaller volume of air than is generally necessary, has enabled the makers to produce a thoroughly reliable combination unit, which will provide an adequate volume of low pressure air for spray painting and low or high pressure air for tyre inflation at a moderate cost.

The new B.E.N. gun utilises a new principle of atomisation, requiring a much smaller volume of air without sacrificing in any way the quality or efficiency of the work performed. This allows a ⅛-H.P. motor to be used with a consequent saving in electric current, beside the saving in weight making for extreme portability. Atomisation is effected perfectly on the discharge of 3½ cubic feet. of air per minute. This shows a considerable saving in material when compared with the normal discharge, as an excess of air merely wastes the material being used.

The automatic control of the unit ensures a constant pressure of air in the tank at all times. Immediately the set is connected in circuit the compressor commences pumping until the air pressure in the receiver reaches the predetermined point of 120 lbs. per square inch, when the motor is automatically cut out of circuit. When the pressure drops to 80 lbs., the motor cuts in and the pressure is raised to 120 lbs. again. By this means a continuous supply of air is always available between 80 and 120 lbs. pressure.

The portable nature of the set enables the machine to be used wherever the work has to be done. All that is necessary is an electrical supply, and the set can be connected up to the ordinary lighting system where power is not available.

The B.E.N. dual air unit will inflate a 38 in. by 7 in. giant pneumatic tyre from zero to 90 lbs. pressure in 3½ minutes, while the current consumption is less than ¾ unit

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# OMNIBUS AND COACH SECTION

## THE ROAD TRAFFIC ACT.

Part I of the Road Traffic Act came into force on December 1, with the exception of Sections 10, 17, 19 and 25. Section 10, which provides for the abolition of the speed limit in the case of ordinary motor cars and motor cycles, is to come into force on January 1. Section 17, which deals with the requirements as to employment of drivers and attendants on motor vehicles and trailers, will become effective on the same date.

Part II, which deals with the provision to be made against third-party risks arising out of the use of motor vehicles, will come into force on January 1.

Part III, which amends the law relating to highways, and deals with the offences of neglecting to comply with traffic directions and of leaving vehicles in dangerous positions, became effective on December 1.

Part IV, which deals with the licensing and regulation of public service vehicles (motor omnibuses and motor coaches), came into force on December 1, so far as is necessary to enable the Traffic Commissioners and their staffs to be appointed. Further provisions of this part of the Act are to come into force on January 1 for the purpose of enabling the Commissioners to receive applications for licences, consents, etc., and to consider them and reach decisions, but the final date on which this Part will become fully operative, *i.e.*, when services of public service vehicles can be operated only under the Traffic Commissioners' licences, has not yet been finally determined. The provisional date which the Minister has in mind for this purpose is April 1 next.

Part V, which confers additional powers on local authorities with respect to the running of public service vehicles, is to come into force on January 1 for the purpose of enabling these authorities to apply to the Traffic Commissioners for their consent to run public service vehicles on new routes outside their areas and for enabling them to make the working agreements with other operators, whether municipal or private, which are authorised by Section 105. It is intended that this part shall become fully operative at the same date as Part IV.

The Minister has already announced his intention of deferring the operation of Section 19 of the Act, which deals with the limitation of time for which drivers of certain vehicles may remain continuously on duty, until February 1.

The Minister is conferring with representatives of railway and canal companies and highway authorities with regard to the provisions of Section 25, which deals with the restriction of the use of weak bridges by heavy vehicles, but the date on which this Section, will become operative has not yet been fixed.

## PRIVATE BILL PROCEDURE.

Important alterations were made by the House of Commons at the end of last session in the standing orders relating to private Bills. The alterations affect the dates at which the various stages in the procedure have to be taken and the forms of the newspaper and Gazette notices. It is understood that the House of Lords will make the same alterations in dates as in the House of Commons. The alterations provide that private Bills must be deposited before instead of after the publication of the newspaper and Gazette notices. The following table, given in the Journal of the Tramways and Light Railways Association, sets out the alterations in the latest dates for the undermentioned stages :—

| *Stage* | *Present Date* | *New Date* |
|---|---|---|
| Deposit of Plans ... ... ... ... ... | November 30 ... | November 20. |
| Deposit of Bills in Parliament ... ... ... | December 17 ... | November 27. |
| Deposit of Bills for inspection and sale and with road authorities, etc. ... ... ... ... | December 21 ... | December 4. |
| Deposit of Estimates, etc. ... ... ... ... | December 31 ... | December 4. |
| First publication of Newspaper notice ... ... | November 20 ... | December 4. |
| Service of notices on landowners, mill-owners, 300 yard-owners, etc. ... ... ... ... | December 15 ... | December 5. |
| Publication of Gazette notice ... ... ... | November 27 ... | December 11. |
| Service of statutory repeal notices, etc. ... ... | December 21 ... | December 11. |
| Money deposits ... ... ... ... ... | January 14 ... | December 14. |
| Giving of Standing Order proofs ... ... ... | January 18 ... | December 18. |
| Deposit of Petitions against Bills - | | |
| House of Commons ... ... ... ... | February 12 ... | January 30. |
| House of Lords ... ... ... ... | February 19 ... | February 6. |

It is expected that these changes of dates will enable Committees on Private Bills to commence sitting in the latter part of February and enable most Bills to receive Royal Assent before the Whitsun recess and more unopposed Bills than under present procedure to be passed before Easter.

## DAIMLER DEMONSTRATION AT NEWCASTLE.

The Daimler Co. on December 2 gave a very successful demonstration at Newcastle with three omnibuses—two double-deck and one single-deck—equipped with their fluid fly-wheel system. A stripped chassis was shown at the Byker depot of the Corporation, and Mr. F. G. Couch, of the Daimler Co., clearly explained the operation of the fluid fly-wheel, and pointed out its advantages. Briefly the system is a device which employs the use of a fluid as a transmitter of energy instead of the usual clutch or friction contact involved in the normal transmission system. The gear-box is of the epicyclic pattern, and the pedal corresponding to the usual clutch pedal operates the change of gear pre-selected by the movement of a lever at the top of the steering column, so that there is no need for the driver to take his hands from the steering wheel in traffic. The engine will turn over with any gear engaged when the bus is stationary, since the fluid fly-wheel only takes up the drive on a level road when the engine revolutions exceed 600 per minute. This system was described in the issue of THE TRAMWAY AND RAILWAY WORLD of November 13.

The visitors were afterwards given an opportunity to test the operation of the machines on the road. The vehicles moved off smoothly up the steep incline of Dean-street, where they were stopped without brakes, and were held by the transmission with the engine still running. They were then restarted easily. On a run to Morpeth, the vehicles were subjected to various tests, which were satisfactorily met. At a luncheon given by the Daimler Co., Alderman Richard Mayne, chairman of the Newcastle Transport Committee, said that one of their difficulties was the question of the future of tramcar drivers when tramcars were replaced by omnibuses. Gear changing seemed to be a matter of "knack," which some tram drivers could not easily acquire. The new system would relieve the tramway authority of difficulty in transferring men from the cars to the buses, owing to the simpler operation. Among those present were the Lord Mayor of Newcastle (Alderman D. Adams), Alderman Mayne, Mr. T. P. Easton, general manager, Newcastle Corporation Transport, and a number of representatives of other neighbouring transport authorities, including Alderman Jeffreys, chairman of the Sunderland Tramways Committee; Mr. C. A. Hopkins, general manager, Sunderland Tramways; Mr. Foskett, engineer, Sunderland Corporation; Mr. H. E. Blackiston, general manager, West Hartlepool Transport; Mr. H. G. Jeken, general manager, Middlesbrough Tramways; Mr. J. R. P. Lunn, engineer and manager, Darlington Transport; Mr. F. H. Briggs, general manager, Tyneside Tramways and Tramroads Co.; Mr. J. Petrie, general manager, and Mr. G. Hayter, engineer, Northern General Transport Co., Ltd.

## SPARE PARTS FOR GUY CHASSIS.

A catalogue of spare parts for the latest "Conquest" and "Invincible" chassis of Guy Motors, Ltd., Wolverhampton, has been issued by the company to enable customers to avoid delay in obtaining supplies and also to ensure the correct parts being supplied. This spare parts list is, of course, supplied free of charge with every new chassis, but copies may be purchased at 3s. 6d. net.

Operators will be interested in the latest catalogue relating to the 'Conquest" chassis, which is already in wide service and was last year prominent at the International Exhibition at Olympia. The "Conquest," with its 50-58 H.P. six-cylinder engine (R.A.C. rating 38 H.P.) is listed at £1,045, and has proved its worth for service omnibus work and for long-distance coaching. For both tasks handsome and serviceable bodies are available. The omnibus saloons are of two capacities. One seats from 32 to 35 persons; the other accommodates 26-28 passengers. Two sizes of saloon are also provided for long-distance travel, one for 26 passengers and the other for 26-32.

## APPOINTMENT OF CERTIFYING OFFICERS.

The Ministry of Transport is appointing the certifying officers in the Area Traffic Commissioners' offices, at salaries of £600 to £700 per annum inclusive, with travelling and other expenses on the usual Civil Service scale. The duties of the appointments will be concerned with the issue of certificates of fitness of public service vehicles, and only applicants who have had technical training and practical experience as mechanical engineers will be considered.

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# OMNIBUS AND COACH SECTION

## GILFORDS FOR COACH COMFORT.

The manner in which Gilford chassis and the several types of body manufactured therefor have won public favour constitutes a feature in the history of motor transport engineering. This achievement of the Gilford Motor Co., Ltd., of High Wycombe, relates to both coach and omnibus work in its several aspects—pleasure, limited stop and long distance. For any of these services a vehicle which is outwardly attractive is a valuable asset. An instance of this is to be seen in the appended illustration of the saloon coach supplied as one of a repeat order from the Westminster Coaching Services, Ltd., operating from London.

The attractive lines of this body harmonise with the design of the radiator and bonnet, and appearance is not marred by the provision which has been made of a sunshine roof, and for carrying luggage at the rear end. Wycombe Motor Bodies, Ltd., executed the bodywork, which has an artistic decoration scheme. While the body is painted buff, the waist line is in salmon, the headwork and window pillars being picked out in gold. The lettering is also in gold.

The high degree of seating comfort due to the upholstered seats attains perfection when regarded from the wider standpoint of riding comfort. In a large measure this is attributable to the front springs being supported on Westinghouse Gruss air springs, which can be seen on each side of the radiator of the coach shown in the illustration. To the rear springs Luvax rebound absorbers are fitted. Suspension is by semi-elliptic springs of the patent divided back type, set into the axle to withstand driving and braking torque. It is asserted that the riding comfort given by this combination is 300 per cent. more than is obtained with large-size balloon tyres regardless of road conditions. Another effect is the prevention of distortion of the frame, thus preventing twisting and wrenching of bodies and fittings, thereby reducing maintenance costs.

Gilford Coach with Wycombe Bodywork.

The Gilford six-cylinder engine fitted to the vehicle gives from 43 to 95 H.P., and is rated at 37 H.P., the maximum output being at 2,600 R.P.M. Cylinder bore is 3 15/16 in., the stroke being 5 in. Cast *en bloc*, the cylinders are of special-grade grey iron, and a detachable head promotes accessibility. Every cylinder is subjected to high-pressure water test to ensure against leaks and imperfections. The cooling system is very effective. Noticeable in the engine lubrication is the insertion of a percolator in the oil feed, thus continually filtering a quantity of oil which is by-passed back into the sump. This ensures that the greater part of all foreign matter is deposited outside the sump. The gear box gives four speeds and reverse. Central change-speed control is simple and efficient, its mechanism being insulated from the chassis frame.

Ample provision has been made for safe operation under the higher speed allowance. The braking system has an automatic equalising device that ensures correct distribution of the servo pressure over all four wheels, giving smooth, powerful braking without tendency towards "pulling" to left or right. Only a slight pressure of the foot is needed to regulate the braking to the finest limits. The steering is of the cam and lever type. As the cam is mounted on ball thrust bearings, combined with an 18 in. dia. steering wheel, and a long forged-steel drop arm, the steering is extraordinarily light.

## OMNIBUS AND COACH SERVICES.

### MUNICIPAL.

OMNIBUSES FOR SOUTHEND.—It has been decided to run a service of motor omnibuses in conjunction with the Southend tramways.

BIRKENHEAD DEPOT PROPOSAL.—A revised scheme for a new car shed and omnibus garage, to cost £18,500, has been submitted to Birkenhead Tramways Committee.

NEW BOURNEMOUTH SERVICES.—Sanction has been obtained by Bournemouth Tramways Committee to run omnibus services in various rural areas around the borough.

WEST HARTLEPOOL-STOCKTON PROPOSAL.—The consent of Durham County Council is being sought by West Hartlepool and Stockton Corporations for a joint omnibus service between the two towns.

SOUTH WALES JOINT SERVICE.—Cardiff Corporation, Caerphilly Urban Council, and the West Monmouth Joint Omnibus Board have started a joint service on the 25-mile route between Cardiff and Markham.

DISPLACEMENT OF STOCKTON TRAMWAYS.—Stockton Corporation has decided that during the next two years, motor omnibuses shall be operated in place of the tramways. The first service is to be between Norton Green and Middlesbrough.

A CHANGE OVER AT LOWESTOFT.—Lowestoft Transport Committee recommends that the change over to motor omnibuses shall be put into operation in April next. The Committee proposes to borrow £18,500 for the provision of omnibuses.

PROPOSED JOINT BOARD AT KEIGHLEY.—In connection with the offer of West Yorkshire Road Car Co. to purchase the transport undertaking of Keighley Corporation, a proposal is under consideration to carry on the two undertakings by means of a joint board.

TEST OF GLASGOW DIESEL OMNIBUS.—An omnibus, fitted with a crude oil engine, has been submitted to a severe test by Glasgow Transport Committee. An A.E.C. omnibus was brought specially from London for the trial. A similar vehicle will shortly be in service in Glasgow.

NEWCASTLE PARCELS SERVICE.—In connection with the omnibuses of Newcastle Corporation a parcels service has been inaugurated. Agents have been appointed in forty towns and villages, and in addition to delivery by agents within a mile radius of their premises, direct delivery is undertaken.

NEW GLASGOW SERVICES.—Renfrewshire County Council has approved of an extension of Glasgow Corporation omnibus services to Clarkston, Giffnock, and Mearns. A new service has been started from South Carntyne to King's Park, and additional omnibuses are being run on the Radnor Park—Carmyle route.

OMNIBUSES AT ABERDEEN.—Councillor George, chairman of Aberdeen Tramways Committee, has stated that as soon as the new omnibuses are available the tramcars will be withdrawn from the Torry route, thus saving £65 per week. The Council has adopted a recommendation by the Committee in favour of replacing the Ferryhill tramcars with omnibuses.

NEWPORT'S APPEAL SUCCEEDS.—While granting the appeal of Newport Corporation against the refusal of St. Mellons Council to licence an omnibus service to St. Bride the Ministry of Transport has upheld the claim of St. Mellons Council that the road must first be improved and bridges strengthened. If Newport desires to run omnibuses a sum of £5,000 must be paid towards the cost of the improvements.

LATEST TYPE VEHICLES AT SOUTHAMPTON.—Six additions lately made to the omnibuses operated by Southampton Tramways Department comprise three A.E.C. "Regent" models and three Thornycroft BC forward type. Each chassis has an all-enclosed double deck body by Park Royal Coachworks, Ltd., London, N.W. Luxurious seating upholstered in leather is provided for 40 persons, and each saloon has three Quicktho half-drop windows.

LEIGH'S NEW GARAGE.—The new garage, workshops and offices for the motor omnibus department at Leigh, Lancs, were opened on November 13 by the Mayor (Councillor W. Higenbottam), with a gold key handed to him by Alderman T. Grundy, chairman of the Omnibus Committee. The Hammond low pressure petrol installation was supplied by the Equipment and Engineering Co., Ltd., London, and the high pressure washing plant by Brown Bros., Ltd., of Manchester. The fleet at present numbers 29, and the manager is Mr. F. Lythgoe.

A DIFFICULT YEAR AT BLACKPOOL.—Commenting on a net loss of £16,883 on the omnibus services during the past financial year,

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# OMNIBUS AND COACH SECTION

Mr. C. Furness, general manager of Blackpool Corporation Transport, states that many routes have not met working expenses. It is hoped to make a substantial saving in mileage and operating costs. The present policy of providing in advance omnibus travelling facilities remote from the tramways will, he says, eventually prove invaluable, especially when the Traffic Commissioners consider the granting or withholding of licences.

NEW MANCHESTER SERVICES.—Manchester Transport Committee has recommended the purchase of fifty covered-top omnibuses at an estimated cost of £82,000. The Corporation now has 162 single-deck and 101 double-deck omnibuses, and the proposed addition will bring the total to 313. Mr. R. Stuart Pilcher, general manager of the Transport Department, reported that forty new omnibuses would be needed for the new Altrincham—Sale route, and recommended a margin of ten more for developments. It is proposed to enlarge the Parrs Wood garage at a cost of about £50,000.

A HOVE VIEW OF THE PROPOSED BRIGHTON MERGER.—Concerning the merger of Brighton Corporation Tramways with Tilling's Omnibus Co., for which Parliamentary powers may be sought, Councillor F. Lee has informed a meeting of Hove ratepayers that the capital would be £780,000, to which sum Hove would contribute £100,000, and would receive interest for £130,000. The profits were estimated at £90,000 a year, which at 10 per cent. would bring in a dividend of £13,000 a year for Hove. Hove now received £3,000 a year from Tillings. On the loan of £100,000, the Corporation would have to repay £6,500 a year which would include the interest, and they would then be making an annual profit of £6,500.

### COMPANY.

A CHELTENHAM EXTENSION.—Cheltenham Watch Committee has granted four licences to the Bristol Tramways and Carriage Co., for a service between Cheltenham and Evesham.

OMNIBUS AND RAIL FARES INCREASED.—Fares by omnibuses and railway between Middlesbrough and Redcar have been raised 25 per cent. An agreement for this purpose was arrived at by the L.N.E. Railway, and the United Automobile and other omnibus owners.

REFUSAL OF LICENCES.—Following the warnings of the Minister of Transport to licensing committees not to grant a flood of applications for licences during the interval before the Traffic Commissioners take up their duties, applications have been refused in all parts of the country.

L.G.O.C. ONE-MAN SERVICES.—Twenty one-man operated omnibuses are being placed in service by the London General Omnibus Co. The model is known as the "Dart," and is manufactured by Dennis Bros., Ltd. Experiments have been made with it at Uxbridge, and on the Bromley-Chislehurst route.

WORCESTER'S SHARE OF PROFITS.—Under the Corporation's arrangement with the Birmingham and Midland Omnibus Co., whereby the company supplied the omnibus services in the city, the sum paid to the Corporation by the company for 1930 has exceeded £11,000. This is an increase of £1,500 on that for 1929.

THE NEW L.G.O.C. OMNIBUSES.—Gradually the A.E.C. and the L.G.O.C. works at Chiswick are adding to the number of S.T. type omnibuses on the London streets. These handsome, luxurious and smooth-riding vehicles, seating 49, are now traversing tramway routes, and the loyalty of rate-paying travellers to the tramways is being severely tried, especially when they ride in an S.T. from outside the county to a tramway terminus.

PROTEST AGAINST A MEDWAY PRIVILEGE.—The Medway District Omnibus Owners' Association have held meetings at Chatham to protest against the privileges granted to the Medway Traction Co., formerly the Chatham and District Traction Co. A resolution was passed calling upon the three town Councils to support an application for an inquiry by the Ministry of Transport into the prohibitions and restrictions against competition created by the Chatham Traction Act.

COMPETITION AT SWANSEA.—At a meeting of Swansea Corporation, Councillor P. Morris asked the chairman of the Watch Committee if he was aware that the granting of omnibus licences to the South Wales Transport Co., Ltd., had resulted in the depletion of the tramways service. Sir Percy Molyneux replied that the matter was one for the Tramways Committee. Replying to a further question, Sir Percy stated that the question of the Council running omnibuses would be a subject for the Traffic Commissioners, and the policy would be a matter for the Parliamentary Committee.

REFUSAL OF 500 RIBBLE LICENCES.—A Ministry of Transport inquiry was held at Burnley on November 21 into the appeal of Ribble Motor Services, Preston, against the refusal of Burnley Corporation to issue to them the same number of licences as in 1929. The Corporation had licensed only 50 of the company's 593 omnibuses. For the Corporation it was stated by the deputy town clerk that 50 licences were sufficient to run all the services authorised by time-tables. Previously they had issued all the licences the Company had asked for, but their use had been restricted to authorised services and approved time-tables. He admitted that the Corporation objected to the extension of the Bury service to Manchester, and that a prosecution instituted by the Corporation was quashed by the Divisional Court.

### LONG-DISTANCE.

LEYLAND "TIGERS" FOR LONDON SERVICES.—The Premier Omnibus Co., Ltd., is introducing Leyland "Tiger" chassis with single-deck bodies for the services between London and Windsor. Bodies to seat 26 passengers are being provided by Duple Bodies and Motors, Ltd., of Hendon.

EIGHT SERVICES A DAY TO OXFORD.—Viking Motor Coaches have started running between 322, Vauxhall Bridge Road, London, and Oxford. Eight services a day each way are proposed. Mr. H. F. King, of High Street, Thame, is the proprietor, and he was formerly with North End Coaches, Portsmouth and Main Line Coaches.

LONDON AND PROVINCIAL CO-OPERATION.—Plymouth Co-operative Society has accepted an agency from Main Lines, London, in connection with long-distance coach tours. According to Mr. J. Hayne Pillar, the president of the society, a very lucrative business is being conducted, and next season there would be further developments.

MANCHESTER COACH OWNERS AMALGAMATE.—Seventeen owners of coaches in Manchester have joined the amalgamated company which has been established under the name of the Manchester Joint Services. Mr. T. Quinn, of Central Motorways, has been chiefly responsible for bringing about the merger. Organisation and administration is to be by central control, but each owner will continue to be responsible for his own vehicles.

NEW STATION AT BOURNEMOUTH.—Richmond Garages, Ltd., hope to have their new station adjacent to The Square ready by next Easter. It will be opposite the station of Elliott Brothers, of the Royal Blue Line, and will be in two floors, each 180 ft. by 140 ft. The entrance to the upper floor will be from Richmond Hill. During the past summer the present quarters of the Richmond Garages have been used by the vehicles of 98 firms, including the Central London Station. Mr. D. T. Davis is the manager and secretary.

LONDON-EDINBURGH-GLASGOW.—About a dozen passengers can be seen at 2.30 p.m. daily leaving Gt. Scotland Yard, Whitehall, for Edinburgh and Glasgow, in a Leyland "Tiger" coach of the Midland Bus Services. The same company runs the 2 p.m. daily coach from Glasgow to London. The services are operated conjointly with the Scottish Motor Traction Co., whose coaches make the night journey from London at 10 p.m., an afternoon run at 2 p.m. from Edinburgh, and night services at 8 p.m., from Glasgow, and at 10 p.m. from Edinburgh. Fares are 30s. single, 50s. return.

SPEED OF LONDON-EDINBURGH OMNIBUSES.—In the House of Commons the Minister of Transport was asked by Mr. W. Thorne if he was aware that four omnibus drivers who were fined at Bedale, Yorkshire, for exceeding the 20 miles speed limit, were all drivers of London to Edinburgh omnibuses. The questioner also asked if the Minister could state the number of hours allowed for the outward and homeward journeys. Mr. Morrison replied that he had no means of ascertaining the times allowed for the completion of journeys by the drivers of coaches. When Part IV of the Road Traffic Act became fully effective, he anticipated that an effective check would be imposed on the time schedules.

GREEN LINE DEVELOPMENTS.—Tickets for the Green Line Services of the L.G.O.C. are now obtainable from an office at the side of the booking-office of the London Underground Railways at Charing Cross. Services now in operation, either from the Embankment or from Oxford Circus, provide express runs to Watford, Guildford, Bushey, Gt. Bookham, Reigate, Redhill, Tring, Windsor, Sunningdale, Eton, Chertsey, Brentwood, Bishop's Stortford, Harpenden, Welwyn Garden City, Oxted and Gravesend. The fleet has been increased by temporarily using a number of the coaches utilised for L.G.O.C. tourist traffic in the summer. At intervals it is being added to by deliveries from the Ipswich works of Ransomes, Sims & Jefferies and Weymann's Motor Bodies, Ltd. Each company is executing an order for 25 saloon bodies, which will be mounted on the "Regal" chassis of the A.E.C.

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# OMNIBUS AND COACH SECTION

## SOME RECENT ORDERS.

THOMAS TILLING, LTD., has purchased an "Eqwhipple" engine starter from the Equipment and Engineering Co., Ltd.

RANSOMES, SIMS AND JEFFERIES, LTD., have an order for five 62-seat double deck omnibus bodies for the City Omnibus Co., Ltd.

EAST SURREY TRACTION CO. has placed a fourth repeat order for power petrolling plant with the Equipment and Engineering Co., Ltd.

THE L.N.E.R. has placed a contract with the Associated Equipment Co. for forty-five 4-ton A.E.C. goods motor vehicles for cartage work.

CARDIFF TRAMWAYS COMMITTEE has recommended the acceptance of the tender of John I. Thornycroft & Co., Ltd., for the supply of six omnibus chassis.

SOUTHEND TRAMWAYS COMMITTEE has recommended the acceptance of the tender of the Associated Equipment Co., Ltd., for the supply of seven single-deck omnibuses.

CROSSLEY MOTORS, LTD., have an order from Stockport Corporation for six 38-110 H.P. six-cylinder chassis fitted with 32-seat saloon service type bodies of Crossley manufacture.

CARDIFF CITY COUNCIL has ordered six six-cylinder omnibus chassis from John I. Thornycroft & Co., Ltd., and six single-deck omnibus bodies from the Northern Counties Co.

BRISTOL TRAMWAYS AND CARRIAGE CO., LTD., are supplying seven type B passenger chassis for Rotherham Corporation, and three for Norwich Electric Tramways, and twelve 30-seat omnibuses for West Riding Automobile Co., Ltd.

THE EQUIPMENT AND ENGINEERING CO., LTD., have recently supplied Luchard high pressure air compressors to Norwich City Tramways, General Motor and Tyre Co., of Hammersmith, Ribble Motor Services, and Newport Corporation.

NEWCASTLE CITY COUNCIL has placed the following contracts:—Karrier street sweeper and refuse collector, £1,010, five S.D. Freighters, £632 each, and a Fowler gully-emptier, with washing and sprinkling apparatus and snow plough, £1,341.

MANCHESTER TRANSPORT COMMITTEE has accepted the following tenders: Joseph Cockshot & Co., Ltd., Manchester, two goods and one passenger motor vehicles; Tudor Accumulator Co., Ltd., and Britannia Batteries, Ltd., electric vehicle batteries.

DENNIS BROTHERS, LTD., are supplying 108 motor vehicles of the 152 recently ordered by the Great Western Railway Co. The Dennis model is their 2-tonner, which is largely used by the Southern Railway, but the G.W.R. order is for the forward control pattern, which gives additional body space.

THE BRITISH ELECTRICAL FEDERATION, which operates omnibus services in many parts of the country, has made a contract with Russian Oil Products for the supply of petrol. It is reported that the amount involved is twenty million gallons. The contract was placed in competition with the combine companies.

CROSSLEY MOTORS, LTD., have a repeat order for six wireless cars from the War Office. A number of these vehicles were supplied in April last to the War Office, and also to the Canadian Government. The basis of the car is the 20-60 H.P. semi-forward control six-wheel chassis, which has a four-cylinder engine. The body is also a Crossley product, and is designed to carry an officer, driver and four men, in addition to a wireless equipment.

THE ASSOCIATED EQUIPMENT CO. has received the following orders for their omnibus models, many of them being repeat orders. "Regent" double-deck.—Walsall Corporation, 8; Lewis Omnibus Co.; City of Oxford Motor Services, 18; Exeter Corporation, 6; Bury Corporation. "Regal" single-deck.—County Motor Services, 4; Yeoman's Bros.; Thorne, 2; Varsity Express Motors, 6; Bush & Twiddy; Bluebelle Motors, Ltd., 20; R. Fox; W. Armitage & Son, 4; Wood Brothers, 4; James, Wolverhampton; Mrs. Batty, 2; J. Roscoe, 2; T. Tilling, Ltd., 2; Ayr & District Motor Services, 12; Fingland's Hire Cars, 2; Belfast Omnibus Company, 20; C. Hollands; E. Paull, 3; Western Welsh Omnibus Co., 6; City of Oxford Motor Services, 6; Keith and Boyle (Orange Luxury Coaches), 20. "Renown" (six-wheel) double-deck, Imperial Motor Co., 3. "Ranger" (forward drive) single-deck, Glasgow and Paris Motor Co. Overseas orders include one from Bombay Electric Tramways Co., for two "Regal" single-deck omnibuses. Numerous home and overseas orders have been received for freight vehicles.

## MOTOR TRAFFIC NOTES.

A NEW LONDON SUBWAY.—At a cost of £11,500 the London County Council has decided to construct a subway for pedestrians between the County Hall and St. Thomas's Hospital.

SAFETY FIRST COUNCIL FOR SCOTLAND.—A Scottish Council of the National Safety First Association has been formed with Mr. H. C. M. Scott as secretary. The office is at 113, St. Vincent St., Glasgow.

FUEL USED BY PARIS OMNIBUSES.—In place of the petrol-benzole mixture lately used by the Paris Transport Co., a mixture of one-third petrol, one-third benzole and one-third alcohol is now being utilised.

NEWCASTLE MUNICIPAL OMNIBUS STATION.—The omnibus station which the Corporation is erecting in Marlborough Crescent, Newcastle, is expected to be open before the end of the year. There will be nine platforms for the accommodation of company and municipal omnibuses.

TESTING THE SPEED OF OMNIBUSES.—Blyth and Ashington members of the road passenger division of the N.U.R. have complained that the speed of their omnibuses has been checked by omnibus officials in a motor car. Some drivers as a result have been accused of reaching 50 m.p.h.

TRACTION EMPLOYEES AND FIRST AID.—On behalf of the first aid to the injured classes which he has conducted for twenty years among the employees of the South Wales Transport Co., Mr. David James, the managing director of the Company, has presented a gold watch to Mr. W. H. Fisher, the instructor.

ROAD FUND GRANTS.—The Minister of Transport announces that during November, schemes for widening, reconstruction, and other improvements of classified roads and bridges, and for construction of new roads and bridges, involving a total estimated expenditure of £2,250,000, were approved for Road Fund grants.

DANGEROUS ROADSIDE TREES.—The Automobile Association, in co-operation with the Road Beautifying Association, has issued an illustrated booklet dealing with the care and treatment of roadside trees, from the points of view of safety to road users, as well as better preservation of trees. Copies have been issued to all highway authorities.

NEW LIFE-SAVING ATTACHMENT.—Dr. Vernon Clifford, of 63, Grosvenor-street, London, has invented a motor vehicle attachment for saving life. It consists of a grooved roller fixed 10 in. above the ground. Automatic action drops this to 2 in. from the ground, and sets it revolving in the opposite direction to that of the wheels of the vehicle, so that anyone falling in front of it is rolled along the ground.

REMEDIES FOR STREET CONGESTION.—Norwich Corporation has adopted a report of a committee appointed to consider remedies for street congestion. The committee recommended (1) that arrangements be made for the voluntary exclusion of commercial vehicles from certain streets at certain hours, and (2) that an order be applied for under the Road Traffic Act, prohibiting the use of such vehicles in four streets.

NEW STATION AT CHELMSFORD.—The Eastern National Omnibus Co. is making extensive alterations to their depot at Chelmsford. When completed, it will be one of the finest stations in the Eastern Counties, from which all long-distance omnibuses will start. New offices and waiting rooms are to be constructed, and departure platforms provided. The L.N.E.R. and the L.M.S.R. are jointly interested in this company.

OMNIBUS DRIVERS ASK FOR NON-SKID ROADS.—The Minister of Transport on December 4 received a resolution passed by the National Committee of the Transport Workers' Union calling for non-skid road surfaces. The group's many members in road passenger services, including omnibus and motor-coach drivers, have found that tar-sprayed roads with good-sized chippings lightly rolled in are among the safest.

MOTOR VEHICLES AND THE NEW ACT.—Speaking at the annual meeting of John I. Thornycroft & Co., Ltd., on November 19, Sir John E. Thornycroft, K.B.E., managing director, said that the market at home for motor vehicles would be to some extent affected by the Road Traffic Act. In addition to defining and limiting speeds for different classes of vehicles, it definitely limited axle loads. In anticipation of the Act, the company had in production new models complying with the provisions, as they were informed that the new regulations would be more strictly enforced, and users would not be able to run vehicles which were flagrantly illegal as regards axle weights.

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# MUNICIPAL OMNIBUS RECORDS

| NAME | Year Ended | Total Capital Outlay to date £ | Total Income £ | Total Operating Expenses £ | Percentage of Operating Expenses to Receipts % | Gross Profit £ | Net Surplus or Deficit £ | Provision for Renewals £ | Total Bus Miles Run | Average Revenue per Bus Mile Total d. | Average Revenue per Bus Mile Traffic d. | Average Fare Paid per Passenger d. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aberdeen .. .. | May 31, 1930 | 52,456 | 90,671 | 72,700 | 80·18 | 17,971 | 10,578 | 8,578 | 2,026,978 | 10·73 | 10·33 | 1·2 |
| Accrington .. | Mar. 31, 1930 | 17,637 | 11,581 | 7,178 | — | 4,403 | 2,632 | — | — | — | — | 2·27 |
| Ashton-U.-L. .. | Mar. 31, 1930 | 19,773 | 25,325 | 19,991 | 69·75 | 5,334 | 2,186 | — | 428,788 | 14·175 | 14·052 | 1·41 |
| Barrow .. .. | Mar. 31, 1930 | 12,873 | 20,308 | 18,526 | 91·0 | 1,782 | — 598 | 1,131 | 530,494 | 8·98 | 8·92 | 1·46 |
| Belfast .. .. | Mar. 31, 1930 | 59,697 | 59,860 | 65,197 | 108·92 | — 5,337 | — 20,714 | 887 | 1,612,210 | 8·91 | 8·78 | 1·88 |
| Birkenhead .. | Mar. 31, 1930 | 160,884 | 181,385 | 116,669 | 64·29 | 64,716 | 25,000 | — | 2,649,644 | 16·427 | 16·384 | 1·955 |
| Birmingham .. | Mar. 31, 1930 | 865,383 | 729,719 | 547,989 | 75·10 | 181,730 | 169,851 | — | 10,422,134 | 16·804 | 16·498 | 1·709 |
| Blackburn .. | Mar. 31, 1930 | 18,315 | 7,769 | 8,257 | 115·33 | — 488 | — 1,855 | — | 132,147 | 13·10 | 12·95 | 1·96 |
| Blackpool .. .. | Mar. 31, 1930 | 80,500 | 67,037 | 68,237 | 101·79 | — 1,200 | — 16,883 | — | 1,641,288 | 9·80 | 9·80 | 1·77 |
| Bolton .. .. | Mar. 31, 1930 | 124,689 | 88,883 | 64,558 | 72·62 | 24,325 | — 6,868 | — | — | — | — | — |
| Bournemouth .. | Mar. 31, 1930 | 30,860 | 22,802 | 23,352 | 102·41 | — 550 | — 4,385 | — | 478,837 | 11·43 | 11·36 | 1·45 |
| Bradford .. .. | Mar. 31, 1930 | 133,108 | 165,994 | 148,580 | 89·51 | 17,414 | — 13,942 | — | — | — | — | — |
| Burnley .. .. | Mar. 31, 1930 | 27,538 | 33,743 | 36,900 | 109·4 | — 3,157 | — 6,376 | — | 1,039,865 | 7·788 | 7·788 | 1·42 |
| Burton .. .. | Mar. 31, 1930 | 57,431 | 30,431 | 24,249 | 79·7 | 6,182 | 1,289 | — | 685,886 | 10·65 | 10·56 | 1·806 |
| Bury .. .. | Mar. 31, 1930 | 29,995 | 34,037 | 24,258 | 72·06 | 9,779 | 4,895 | 1,263 | 694,050 | 11·769 | 11·660 | 2·10 |
| Cardiff .. .. | Mar. 31, 1930 | 147,616 | 156,640 | 143,255 | 91·45 | 13,385 | — 4,871 | — | 2,938,165 | 12·79 | 12·63 | 3·053 |
| Chester .. .. | Mar. 31, 1930 | 22,414 | 3,749 | 3,463 | 92·0 | 286 | 28 | — | 71,400 | 12·60 | 12·60 | 1·26 |
| Chesterfield .. | Mar. 31, 1930 | 98,081 | 71,166 | 78,170 | 86·0 | 9,754 | — 7,003 | — | 1,449,900 | 13·39 | 11·57 | 2·24 |
| Colchester .. | Mar. 31, 1930 | 25,602 | 25,767 | 20,060 | 77·85 | 5,707 | 2,097 | — | 487,094 | 12·69 | 12·33 | 1·72 |
| Colne .. .. | Mar. 31, 1930 | 19,350 | 22,103 | 19,189 | 86·0 | 2,914 | — 1,526 | 879 | 501,911 | 10·56 | 10·45 | 1·98 |
| Coventry .. .. | Mar. 31, 1930 | 90,376 | 89,085 | 72,615 | 81·0 | 16,470 | 7,682 | 1,178 | 1,358,464 | 15·738 | 15·738 | 1·99 |
| Darlington .. | Mar. 31, 1930 | — | 1,811 | 2,997 | 165·4 | — 1,186 | — | — | — | — | — | — |
| Derby .. .. | Mar. 31, 1930 | 465,218 | 41,472 | 36,487 | 87·98 | 4,985 | 352 | — | 616,421 | 16·147 | 16·147 | 1·606 |
| Douglas, I.O.M. .. | Mar. 31, 1930 | 24,535 | 21,244 | 20,757 | 97·7 | 487 | 487 | — | 438,251 | 11·630 | 11·387 | 2·096 |
| Dundee .. .. | May 15, 1930 | 43,264 | 45,293 | 34,704 | 76·612 | 10,594 | 1,343 | — | 771,780 | 14·087 | 13·786 | 1·417 |
| Eastbourne .. | Mar. 31, 1930 | 25,676 | 81,686 | 67,288 | 91·67 | 14,398 | 6,440 | — | 1,169,917 | 16·32 | 15·68 | 1·34 |
| Edinburgh .. .. | May 15, 1930 | 351,685 | 182,659 | 166,451 | 91·127 | 16,208 | 505 | — | 3,501,201 | 12·52 | 12·42 | 1·438 |
| Exeter .. .. | Mar. 31, 1930 | 19,380 | 9,725 | 8,065 | 82·94 | 1,660 | — 836 | — | 210,649 | 11·080 | 11·064 | 1·569 |
| Glasgow .. .. | May 31, 1930 | 421,237 | 349,736 | 287,191 | 77·97 | 62,545 | 1,563 | 60,982 | 5,565,616 | 15·066 | 15·060 | 1·744 |
| Gloucester .. | Mar. 31, 1930 | 16,222 | 10,877 | 8,598 | 79·0 | 2,279 | 1,952 | 1,000 | 243,697 | 10·71 | 10·71 | 1·57 |
| Great Yarmouth .. | Mar. 31, 1930 | 227,726 | 29,799 | 18,857 | 63·0 | 10,942 | 6,650 | 1,724 | 493,748 | 14·485 | 14·45 | 1·964 |
| Grimsby .. .. | Mar. 31, 1930 | 20,724 | 29,088 | 20,906 | 71·88 | 8,182 | — | — | 560,972 | 11·567 | 11·558 | 1·362 |
| Halifax .. .. | Mar. 31, 1930 | 98,100 | 28,319 | 28,303 | 99·94 | 16 | — 10,442 | — | 563,988 | 12·05 | 12·03 | 2·42 |
| Haslingden .. | Mar. 31, 1930 | 9,954 | 5,653 | 3,391 | 60·0 | 2,261 | 990 | — | 86,642 | 15·64 | 15·52 | 2·44 |
| Huddersfield .. | Mar. 31, 1930 | 18,003 | 99,130 | 85,147 | 85·89 | 13,983 | 1,371 | 8,856 | 2,180,246 | 10·91 | 10·89 | 2·78 |
| Hull .. .. | Mar. 31, 1930 | 71,329 | 74,885 | 64,725 | 86·13 | 10,160 | 380 | — | 1,309,563 | 13·72 | 13·72 | 1·77 |
| Keighley .. .. | Mar. 31, 1930 | 48,839 | 46,781 | 37,426 | 77·6 | 9,355 | 1,100 | 1,100 | — | — | — | 2·754 |
| Kilmarnock .. | May 15, 1930 | 23,232 | 25,209 | 22,142 | 87·08 | 3,067 | — 425 | — | 466,854 | 12·959 | 12·860 | 1·153 |
| Lancaster .. .. | Mar. 31, 1930 | 29,061 | 10,677 | 10,868 | 102·0 | — 191 | — 2,573 | — | 239,052 | 10·72 | 10·55 | 1·126 |
| Leeds .. .. | Mar. 31, 1930 | 164,862 | 106,273 | 131,772 | 123·9 | —25,499 | — 34,704 | — | — | — | — | — |
| Leicester .. .. | Mar. 31, 1930 | 115,224 | 89,087 | 80,891 | 91·0 | 8,196 | — 1,829 | — | 1,340,446 | 15·950 | 15·950 | 1·684 |
| Leigh .. .. | Mar. 31, 1930 | 56,949 | 46,281 | 33,894 | 73·0 | 12,387 | 7,034 | 5,336 | 909,012 | 12·22 | 12·17 | 1·79 |
| Lincoln .. .. | Mar. 31, 1930 | 101,647 | 48,270 | 39,514 | 81·86 | 8,756 | — 3,082 | — | 768,808 | 15·07 | 15·05 | 1·83 |
| Liverpool .. .. | Mar. 31, 1930 | 247,604 | — | — | — | — | — | — | 2,707,169 | — | — | — |
| Lytham S.A. .. | Mar. 31, 1930 | 13,788 | 13,386 | 13,289 | 99·27 | 97 | — 2,551 | — | 444,844 | 7·22 | 7·22 | 1·68 |
| Maidstone .. | Mar. 31, 1930 | 23,018 | 16,349 | 15,399 | 94·19 | 949 | — 2,182 | — | 302,579 | 12·967 | 12·860 | 1·378 |
| Manchester .. | Mar. 31, 1930 | 469,439 | 282,649 | 221,434 | 82·0 | 61,214 | 16,037 | 15,061 | 4,759,602 | 14·252 | 13·675 | 2·66 |
| Merthyr Tydfil .. | Mar. 31, 1930 | 29,409 | 28,109 | 23,329 | 82·99 | 8,038 | 4,780 | 4,780 | 568,457 | 11·867 | — | 2·25 |
| Middlesbrough .. | Mar. 31, 1930 | 71,883 | 28,731 | 24,942 | 88·0 | 3,789 | — 1,665 | — | 602,059 | 11·34 | 11·27 | 1·76 |
| M'cambe&Heysham | Mar. 31, 1930 | 55,179 | 37,012 | 28,348 | 76·6 | 8,664 | 1,564 | — | 701,416 | 12·67 | 12·63 | 1·76 |
| Nelson .. .. | Mar. 31, 1930 | 136,855 | 17,324 | 15,626 | 90·20 | 1,698 | — 1,489 | — | 342,818 | 12·11 | 11·36 | 1·68 |
| Newcastle .. .. | Mar. 31, 1930 | 95,947 | 108,169 | 101,142 | 93·50 | 7,027 | 6,420 | — | 2,968,109 | — | — | 2·32 |
| Newport .. .. | Mar. 31, 1930 | 44,591 | 40,226 | 37,403 | 92·981 | 2,823 | — 4,635 | 5,725 | 816,300 | 11·827 | 11·754 | 1·934 |
| Northampton .. | Mar. 31, 1930 | — | 35,589 | 30,345 | 85·0 | 5,244 | — | — | 575,448 | — | 14·62 | 1·34 |
| Nottingham .. | Mar. 31, 1930 | 61,319 | 34,519 | 23,058 | 66·8 | 11,461 | — | — | 469,580 | — | — | — |
| Oldham .. .. | Mar. 25, 1930 | 119,374 | 104,997 | 104,155 | 99·2 | 842 | — 20,073 | — | 1,776,780 | 14·183 | 14·156 | 1·838 |
| Plymouth .. .. | Mar. 31, 1930 | 160,346 | 108,730 | 83,639 | 76·0 | 25,091 | 9,853 | — | 2,183,222 | 11·952 | 11·782 | 1·732 |
| Portsmouth .. | Mar. 31, 1930 | 90,984 | 114,276 | 104,823 | 88·7 | 9,453 | — 6,064 | 14,560 | 2,031,907 | 13·50 | 13·48 | 1·53 |
| Preston .. .. | Mar. 31, 1930 | 32,199 | 26,039 | 20,488 | 78·7 | 5,551 | 1,352 | — | 365,688 | 17·089 | 17·067 | 1·488 |
| Ramsbottom .. | Mar. 31, 1930 | 21,018 | 14,124 | 12,794 | 90·51 | 1,330 | — 1,157 | — | 302,469 | 11·220 | 10·942 | 2·13 |
| Rawtenstall .. | Mar. 31, 1930 | 20,549 | 28,913 | 22,461 | 77·20 | 6,451 | 2,169 | 2,169 | 515,269 | 13·47 | 13·29 | 2·97 |
| Reading .. .. | Mar. 31, 1930 | 56,680 | 50,419 | 47,396 | 87·7 | 3,023 | — 4,736 | 3,164 | 868,354 | 13·935 | 13·813 | 2·23 |
| Rochdale .. .. | Mar. 31, 1930 | 57,624 | 81,779 | 54,004 | 66·03 | 27,775 | 16,217 | 4,173 | 1,569,367 | 12·565 | 12·533 | 2·750 |
| Rotherham .. | Mar. 31, 1930 | 67,532 | 68,334 | 47,895 | 70·0 | 20,439 | 11,191 | — | 1,183,489 | 13·87 | 13·40 | 2·70 |
| St. Helens .. | Mar. 31, 1930 | 22,222 | 21,899 | 19,836 | 90·575 | 2,063 | — 1,421 | 2,053 | 519,907 | 10·109 | 10·019 | 2·559 |
| Salford .. .. | Mar. 31, 1930 | 125,032 | 159,663 | 135,857 | 85·0 | 23,806 | 4,226 | 4,226 | 2,961,963 | 16·242 | 16·234 | 2·44 |
| Sheffield .. .. | Mar. 31, 1930 | 204,698 | 185,631 | 160,146 | 86·3 | 25,538 | 21,743 | 18,952 | — | — | — | — |
| Southampton .. | Mar. 31, 1930 | 52,174 | 45,342 | 42,438 | 94·0 | 2,904 | — 3,443 | — | 942,652 | 11·544 | 11·013 | 1·85 |
| Southport .. .. | Mar. 31, 1930 | 15,174 | 19,333 | 15,060 | 77·89 | 4,273 | 2,346 | — | 465,693 | 9·964 | 9·964 | 2·054 |
| South Shields .. | Mar. 31, 1930 | 13,218 | 13,247 | 12,981 | 97·98 | 266 | — 2,169 | — | 286,719 | 11·089 | 11·078 | 2·075 |
| Stalybridge .. | Mar. 31, 1930 | 66,157 | 79,579 | 59,195 | 74·38 | 20,384 | 14,597 | 6,300 | 1,496,936 | 12·758 | 12·665 | 1·81 |
| Stockport .. .. | Mar. 31, 1930 | 58,670 | 56,714 | 48,075 | 84·76 | 8,639 | 2,269 | 6,370 | 1,133,031 | 12·01 | 11·99 | 1·36 |
| Stockton .. .. | Mar. 31, 1930 | 74,042 | 69,797 | 56,277 | 81·80 | 13,520 | 7,222 | 4,673 | 1,089,369 | 15·38 | 15·14 | 2·1 |
| Sunderland .. | Mar. 31, 1930 | 15,900 | 13,753 | 11,612 | 84·43 | 2,141 | 1,584 | 578 | 249,150 | — | 13·248 | 1·13 |
| Swindon .. .. | Mar. 31, 1930 | 58,185 | 40,679 | 38,222 | 94·0 | 2,457 | — 3,500 | — | 780,268 | 12·51 | 12·43 | 1·49 |
| Tees-side .. .. | Mar. 31, 1930 | 5,456 | 7,404 | 6,916 | 93·4 | 488 | — | — | 180,726 | 9·91 | 9·83 | 2·01 |
| Wallasey .. .. | Mar. 31, 1930 | 138,446 | 109,284 | 67,940 | 62·17 | 41,344 | 24,047 | 2,890 | 1,428,302 | 18·36 | 18·33 | 2·08 |
| Walsall .. .. | Mar. 31, 1930 | 155,975 | 138,904 | 95,861 | 68·711 | 43,043 | 20,302 | — | 2,491,128 | 13·443 | 12·906 | 2·511 |
| Warrington .. | Mar. 31, 1930 | 25,100 | 24,137 | 16,482 | 71·747 | 7,654 | 6,895 | — | 298,083 | 19·648 | 19·432 | 1·106 |
| West Bridgford .. | Mar. 31, 1930 | 18,226 | 23,083 | 21,283 | 73·5 | 6,012 | 1,300 | — | 476,033 | 11·61 | — | — |
| West Bromwich .. | Mar. 31, 1930 | 61,258 | 35,304 | 27,004 | 81·37 | 8,300 | 2,782 | — | 655,691 | 12·922 | 12·893 | 1·937 |
| West Hartlepool .. | Mar. 31, 1930 | 29,254 | 21,495 | 15,257 | 75·0 | 6,238 | 2,793 | — | 415,428 | 12·42 | 12·36 | 2·56 |
| Wigan .. .. | Mar. 31, 1930 | 70,657 | 64,925 | 52,952 | 82·17 | 11,973 | 2,862 | 943 | 1,204,902 | 12·93 | 12·91 | 2·13 |
| Wolverhampton .. | Mar. 31, 1930 | 117,017 | 143,536 | 117,300 | 80·38 | 26,236 | — | 3,301 | 2,251,607 | 15·300 | 15·172 | 2·045 |
| York .. .. | Mar. 31, 1930 | 28,241 | 23,202 | 19,435 | 83·76 | 3,767 | — 18 | — | 519,612 | 10·71 | 10·63 | 1·95 |

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# MUNICIPAL OMNIBUS RECORDS

| NAME | Operating Expenses per Bus Mile | | | | | | | Length of Route | Average Miles per Day per Bus | Average Speed per Hour | Number of Buses | | Total Passengers Carried | Passengers per Bus Mile | Average Distance of 1d. Fare. Miles |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Traffic d. | General d. | Licences d. | Repairs and Maintenance d. | Fuel d. | Miscellaneous d. | Total d. | Miles | d. | Miles | In Use Daily | In Stock | | | |
| Aberdeen .. .. | 3·692 | ·629 | ·447 | 1·581 | 2·227 | ·031 | 8·600 | 15·67 | 94·0 | 9·20 | 60 | 63 | 17,285,230 | 8·52 | ·97 |
| Accrington .. | — | — | — | — | — | — | — | — | — | — | — | 12 | 1,223,216 | — | — |
| Ashton-U.-L. .. | 4·208 | 1·059 | ·452 | 2·889 | 2·581 | — | 11·189 | 13·0 | 125·0 | 12·0 | 11 | 15 | 4,821,767 | 11·24 | ·70 |
| Barrow .. .. | 3·73 | ·72 | ·40 | 1·21 | 2·13 | — | 8·19 | 24·35 | 109·5 | 11·63 | 14 | 16 | 3,228,179 | 8·94 | ·80 |
| Belfast .. .. | 3·20 | ·68 | ·47 | 2·01 | 1·79 | 1·55 | 9·70 | 42·0 | 102·0 | 10·5 | 50 | 58 | 7,497,972 | 4·65 | 1·125 |
| Birkenhead .. | 5·096 | 1·052 | ·657 | 1·412 | 2·211 | ·139 | 10·567 | 77·81 | 96·76 | 10·0 | 74 | 105 | 22,218,135 | 8·37 | ·75 |
| Birmingham .. | 5·425 | ·665 | ·578 | 2·939 | 2·712 | ·300 | 12·619 | 90·54 | 117·3 | 9·98 | 285 | 314 | 99,881,142 | 9·58 | 1·00 |
| Blackburn .. | 6·74 | 1·58 | ·65 | 3·12 | 2·91 | — | 15·00 | 16·92 | 110·0 | 10·5 | 10 | 12 | 870,918 | 7·0 | — |
| Blackpool .. .. | 5·35 | ·81 | — | 1·16 | 2·66 | — | 9·98 | 50·0 | — | — | 45 | 62 | 8,791,032 | 5·37 | — |
| Bolton .. .. | — | — | — | — | — | — | — | — | — | — | — | 53 | — | — | — |
| Bournemouth .. | 4·32 | 1·36 | ·74 | 2·44 | 2·84 | — | 11·7 | 13·0 | 93·0 | 10·0 | 15 | 25 | 3,734,744 | 7·80 | ·75 |
| Bradford .. .. | — | — | — | — | — | — | — | 73·28 | — | 10·41 | 61 | 90 | 20,289,359 | — | ·81 |
| Burnley .. .. | 3·797 | ·463 | ·300 | 1·685 | 2·205 | ·067 | 8·517 | 14·5 | 121·0 | 10·0 | 23 | 25 | 5,681,369 | 5·46 | ·5 |
| Burton .. .. | 3·78 | ·81 | ·50 | 1·16 | 2·23 | — | 8·48 | 19·0 | 82·0 | 7·41 | 34 | 41 | 3,958,324 | 5·80 | ·621 |
| Bury .. .. | 3·288 | ·709 | ·318 | 1·402 | 2·289 | — | 8·006 | 87·25 | 146·0 | 13·60 | 18 | 19 | 3,868,640 | 5·6 | ·73 |
| Cardiff .. .. | 6·36 | ·55 | — | 2·23 | 2·47 | ·09 | 11·70 | 77·0 | 143·0 | 7·6 | 75 | 94 | 12,026,303 | 4·09 | ·66 |
| Chester .. .. | 5·24 | 2·02 | ·66 | 1·42 | 2·16 | ·12 | 11·62 | 7·7 | 116·0 | 9·0 | 14 | 16 | 714,014 | 10·0 | ·8 |
| Chesterfield .. | 4·63 | 1·02 | ·57 | 1·81 | 2·13 | — | 10·16 | 40·0 | 136·0 | 12·0 | 30 | 62 | 7,466,608 | 5·15 | ·73 |
| Colchester .. | 4·662 | ·960 | ·573 | 1·714 | 1·975 | — | 9·884 | 12·49 | 103·33 | 7·97 | 12·91 | 19 | 3,480,224 | 7·14 | ·60 |
| Colne .. .. | 3·56 | ·71 | ·53 | 2·24 | 2·13 | — | 9·17 | 22·75 | 69·0 | 10·0 | 18 | 22 | 2,647,421 | 5·27 | ·75 |
| Coventry .. .. | 4·955 | 1·356 | ·482 | 2·988 | 3·014 | ·034 | 12·829 | 40·0 | 101·0 | 8·77 | 38 | 43 | 10,739,488 | 7·9 | ·67 |
| Darlington .. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Derby .. .. | 6·691 | 1·096 | 1·040 | 2·310 | 2·836 | ·233 | 14·206 | 12·75 | 119·0 | 7·80 | 12 | 29 | 6,199,388 | 10·057 | ·63 |
| Douglas, I.O.M. .. | — | — | — | — | — | — | 11·376 | 8·25 | 92·0 | 13·5 | 22 | 33 | 2,380,611 | 5·43 | ·65 |
| Dundee .. .. | 4·611 | ·934 | ·520 | 2·010 | 2·718 | — | 10·793 | 20·23 | 117·0 | 10·75 | 18 | 28 | 7,505,269 | 9·724 | ·893 |
| Eastbourne .. | 6·73 | ·22 | ·58 | 2·29 | 2·20 | 2·94 | 14·96 | — | — | — | — | 53 | 14,063,225 | 12·02 | — |
| Edinburgh .. .. | 5·024 | ·707 | ·511 | 2·138 | 2·735 | ·294 | 11·409 | 51·0 | 110·0 | 9·5 | 90 | 148 | 29,437,803 | 8·41 | ·87 |
| Exeter .. .. | 4·071 | 1·265 | ·514 | 1·058 | 2·281 | — | 9·189 | 10·19 | 130·66 | 7·79 | 7 | 10 | 1,485,075 | 7·05 | ·51 |
| Glasgow .. .. | 4·390 | ·865 | ·537 | 2·689 | 3·079 | ·181 | 11·741 | 87·90 | 142·10 | 10·98 | 107·31 | 201 | 48,066,753 | 8·636 | 1·15 |
| Gloucester .. | 4·09 | ·98 | ·44 | ·74 | 2·00 | ·22 | 8·47 | 10·37 | 99·4 | 7·66 | 12 | 16 | 1,657,867 | 6·80 | ·5 |
| Great Yarmouth .. | 4·048 | 1·171 | ·463 | 1·393 | 2·091 | — | 9·166 | — | 122·0 | — | 11·02 | 21 | 3,632,614 | 7·36 | — |
| Grimsby .. .. | 4·029 | ·598 | ·317 | 1·532 | 1·838 | — | 8·314 | 10·89 | 118·0 | 10·07 | 14 | 17 | 4,663,480 | 8·3 | ·94 |
| Halifax .. .. | 4·558 | ·868 | ·456 | 2·946 | 3·216 | — | 12·044 | 23·92 | 80·93 | — | 19 | 28 | 2,800,372 | 4·96 | — |
| Haslingden .. | 3·69 | ·70 | ·70 | 1·79 | 2·50 | — | 9·38 | 7·0 | 59·0 | — | 4 | 10 | 538,208 | 6·0 | 1·16 |
| Huddersfield .. | 3·16 | ·71 | ·39 | 2·14 | 2·97 | — | 9·37 | 117·0 | 115·0 | 10·09 | 52 | 64 | 8,532,763 | 3·91 | 1·06 |
| Hull .. .. | 5·09 | ·48 | ·69 | 2·55 | 2·82 | ·23 | 11·86 | 19·36 | 105·92 | 7·78 | 28·83 | 45 | 10,105,342 | 7·72 | — |
| Keighley .. .. | — | — | — | — | — | — | — | 45·0 | — | — | 28 | 30 | — | — | — |
| Kilmarnock .. | 5·164 | 1·136 | ·452 | 2·024 | 2·510 | — | 11·286 | 7·0 | 110·35 | 7·40 | 11·59 | 16 | 5,207,184 | 11·15 | ·80 |
| Lancaster .. .. | 2·67 | 2·33 | ·90 | 1·76 | 3·02 | ·23 | 10·91 | 12·9 | 65·0 | 8·5 | 9·5 | 19 | 1,990,029 | 8·56 | 1·0 |
| Leeds .. .. | — | — | — | — | — | — | — | 90·25 | — | — | — | 81 | 13,338,041 | — | ·71 |
| Leicester .. .. | 7·950 | ·642 | ·693 | 1·920 | 3·234 | ·044 | 14·483 | 16·60 | 83·46 | 8·929 | 44 | 52 | 12,694,018 | 9·47 | 1·042 |
| Leigh .. .. | 4·30 | 1·07 | ·46 | 1·17 | 1·95 | — | 8·95 | 14·83 | 97·0 | 10·0 | 24 | 29 | 4,964,838 | 5·32 | ·59 |
| Lincoln .. .. | 5·41 | 1·36 | ·66 | 2·08 | 2·55 | ·28 | 12·34 | 21·25 | 105·60 | 9·3 | 20 | 32 | 6,280,419 | 8·17 | ·75 |
| Liverpool .. .. | — | — | — | — | — | — | — | — | — | — | — | — | 23,547,341 | — | — |
| Lytham S.A. .. | 2·29 | ·58 | ·25 | 2·12 | 1·87 | ·06 | 7·17 | 15·23 | 150·0 | 8·75 | 10 | 13 | 1,896,268 | 4·26 | ·666 |
| Maidstone .. | 5·130 | 1·024 | ·710 | 2·440 | 2·910 | — | 12·214 | 6·248 | 76·9 | 8·03 | 10·8 | 14 | 2,823,400 | 9·331 | ·598 |
| Manchester .. | 5·047 | ·739 | ·371 | 2·508 | 2·217 | ·284 | 11·166 | 210·0 | 93·1 | 10·96 | 140 | 190 | 24,430,042 | 5·13 | ·898 |
| Merthyr Tydfil .. | — | — | — | — | — | — | 8·473 | 26·0 | 82·0 | — | 18 | 23 | 2,996,672 | — | — |
| Middlesbrough .. | 4·12 | 1·04 | ·46 | 1·74 | 2·43 | ·04 | 9·83 | 17·18 | 123·50 | 8·3 | 14 | 22 | 3,737,022 | 6·20 | 1·0 |
| M'cambe&Heysham | 4·52 | ·82 | ·47 | 1·64 | 2·25 | — | 9·70 | 13·53 | 68·8 | 9·12 | 21·5 | 28 | 5,040,438 | 7·04 | ·799 |
| Nelson .. .. | 4·48 | ·70 | ·46 | 1·88 | 3·41 | — | 10·93 | 11·25 | 85·0 | 6·0 | 11 | 14 | 2,278,160 | 6·65 | ·75 |
| Newcastle .. .. | 3·739 | ·376 | ·332 | 1·715 | 2·016 | — | 8·178 | 71·5 | 155·0 | 12·88 | 47 | 72 | 11,135,707 | 3·75 | ·91 |
| Newport .. .. | 4·768 | ·942 | ·461 | 2·290 | 2·536 | — | 10·997 | 28·0 | 130·0 | 10·0 | 30 | 34 | 4,959,790 | 6·076 | ·875 |
| Northampton .. | 4·35 | 1·56 | ·85 | 2·18 | 3·71 | — | 12·65 | 14·175 | 128·58 | 7·27 | 43 | 50 | 6,261,503 | 10·9 | — |
| Nottingham .. | 6·64 | — | — | — | 2·17 | — | 11·91 | — | — | — | — | — | — | — | — |
| Oldham .. .. | 5·091 | ·664 | ·618 | 4·290 | 3·406 | — | 14·069 | 102·0 | 81·0 | 11·0 | 43·5 | 58 | 13,635,511 | 7·755 | ·80 |
| Plymouth .. .. | 3·310 | ·474 | ·339 | 2·711 | 2·360 | — | 9·194 | 45·0 | 103·0 | 9·13 | 58 | 78 | 14,847,535 | 6·80 | ·74 |
| Portsmouth .. | 5·202 | 1·102 | ·517 | 2·742 | 2·870 | ·033 | 12·466 | 21·33 | 130·0 | 10·0 | 47 | 57 | 17,867 070 | 8·8 | ·25 |
| Preston .. .. | 6·434 | 1·123 | ·781 | 1·958 | 2·925 | ·225 | 13·446 | 7·84 | 104·0 | 8·0 | 11 | 19 | 4,195,628 | 11·473 | ·511 |
| Ramsbottom .. | 4·164 | 1·313 | ·465 | 1·917 | 2·287 | — | 10·146 | 26·0 | 58·62 | 13·5 | 10 | 14 | 1,585,929 | 5·90 | 1·0 |
| Rawtenstall .. | 4·67 | ·77 | ·42 | 2·19 | 2·41 | — | 10·46 | 40·77 | 101·0 | 11·0 | 12 | 14 | 2,308,264 | 4·48 | ·676 |
| Reading .. .. | 4·818 | ·633 | ·515 | 3·465 | 2·794 | ·874 | 13·099 | 25·0 | 125·0 | 9·0 | 24 | 29 | 5,171,888 | 5·95 | ·61 |
| Rochdale .. .. | 3·908 | ·564 | ·355 | 1·439 | 1·994 | — | 8·260 | 93·0 | 143·0 | 11·0 | 28 | 33 | 7,137,023 | 4·54 | ·75 |
| Rotherham .. | — | — | — | — | 2·1 | — | — | 111·784 | 88·0 | 10·1 | 37 | 46 | 5,854,274 | 4·8 | ·88 |
| St. Helens .. | 3·407 | ·875 | ·480 | 2·049 | 2·057 | ·289 | 9·157 | 30·0 | 99·0 | 12·0 | 14 | 20 | 2,035,263 | 3·91 | ·744 |
| Salford .. .. | 4·543 | ·952 | ·372 | 2·591 | 2·336 | — | 10·794 | 162·07 | 156·0 | 12·0 | 52 | 76 | 15,479,986 | 5·23 | 1·05 |
| Sheffield .. .. | — | — | — | — | — | — | — | 300·0 | — | 12·6 | 131 | 162 | 28,093,352 | — | 1·035 |
| Southampton .. | 3·889 | 1·453 | ·501 | 2·535 | 2·427 | — | 10·805 | 28·0 | 130·0 | 9·656 | 34 | 37 | 5,612,199 | 5·954 | ·7 |
| Southport .. .. | 3·151 | ·607 | ·377 | 1·553 | 1·899 | ·175 | 7·762 | 14·9 | 159·0 | 11·550 | 9 | 11 | 2,258,633 | 4·850 | 1·2 |
| South Shields .. | 4·550 | ·646 | ·488 | 2·554 | 2·628 | — | 10·866 | 6·755 | 117·0 | 9·26 | 6 | 14 | 1,494,339 | 5·21 | ·542 |
| Stalybridge .. | 4·208 | ·799 | ·409 | 1·642 | 2·488 | — | 9·546 | 55·17 | 121·0 | 12·0 | 43 | 56 | 10,447,725 | 6·97 | ·6125 |
| Stockport .. .. | 4·725 | ·923 | ·448 | 1·698 | 2·389 | 1·349 | 11·532 | 41·62 | 85·0 | 11·42 | 32 | 42 | 8,141,346 | 7·19 | 1·0 |
| Stockton .. .. | 5·07 | ·70 | ·77 | 2·68 | 3·18 | — | 12·40 | 27·0 | 64·88 | 10·6 | 46 | 47 | 7,920,996 | 7·2 | ·730 |
| Sunderland .. | 5·049 | 2·341 | ·635 | ·871 | 2·290 | — | 11·226 | 11·05 | 75·8 | 8·5 | 9 | 13 | 2,910,486 | 11·7 | 1·3 |
| Swindon .. .. | 5·16 | 1·01 | ·65 | 2·18 | 2·59 | ·16 | 11·75 | 21·1 | 126·0 | 9·0 | 25 | 38 | 6,504,693 | 8·34 | ·6 |
| Tees-side .. .. | 3·72 | 1·34 | ·40 | 1·56 | 2·16 | — | 9·18 | 5·37 | 123·0 | 10·0 | 4 | 4 | 883,396 | 4·88 | ·5 |
| Wallasey .. .. | 5·13 | 1·15 | ·89 | 1·16 | 3·04 | ·04 | 11·41 | 23·0 | 97·83 | 11·97 | 40 | 56 | 12,560,361 | 8·79 | ·544 |
| Walsall .. .. | 4·777 | ·916 | ·447 | 1·400 | 1·695 | ·002 | 9·237 | 211·0 | 107·0 | 9·498 | 64 | 77 | 12,803,948 | 5·140 | ·69 |
| Warrington .. | 6·506 | ·811 | ·923 | 1·783 | 3·247 | ·001 | 13·270 | 4·83 | 115·511 | 7·219 | 7·07 | 13 | 5,235,511 | 17·564 | ·805 |
| West Bridgford .. | — | — | — | ·77 | — | — | 10·73 | — | 160·0 | 10·2 | 14 | 18 | 3,396,039 | 6·92 | 1·2 |
| West Bromwich .. | 4·229 | 1·169 | ·503 | 1·415 | 2·568 | — | 9·884 | 30·52 | 80·595 | 9·24 | 30 | 33 | 4,770,242 | 6·268 | 1·097 |
| West Hartlepool .. | 2·70 | ·79 | ·51 | 2·61 | 2·20 | — | 8·81 | 23·69 | 95·0 | 7·5 | 12 | 16 | 1,999,135 | 4·81 | ·67 |
| Wigan .. .. | 4·48 | 1·18 | ·42 | 2·21 | 2·22 | ·03 | 10·54 | 52·64 | 123·0 | 10·55 | 29 | 36 | 7,299,070 | 6·06 | ·71 |
| Wolverhampton .. | 5·558 | ·969 | ·540 | 2·243 | 2·955 | ·034 | 12·299 | 155·0 | 122·0 | 8·607 | 51 | 69 | 15,522,399 | 6·75 | ·835 |
| York .. .. | 3·77 | ·88 | ·44 | 1·51 | 2·34 | ·03 | 8·97 | 15·91 | 79·0 | 8·97 | 18 | 21 | 2,824,514 | 5·435 | — |

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## THE HIGHWAY CODE.

The draft of the Highway Code which has now been circulated by the Minister of Transport for criticism and suggestions by interested parties is full of excellent precepts and paternal admonitions. When issued to the public its provisions will clarify much that is at present obscure and give uniformity to the rules of the road throughout the country. It comprises directions for the guidance of those using the roads, and sections are addressed to motorists, motor cyclists, drivers of horse-drawn vehicles, persons in charge of animals, pedal cyclists and pedestrians, and there are diagrams of traffic signals that every road user should know. In general it constitutes an appeal for common sense, courtesy, and forbearance. Its paternal tone may fail to impress properly any but novices, and it would probably have been better if it had been presented as directions or with some other semblance of authority. Criticisms of the draft, however, will probably be few. One paragraph that should be strengthened before the Code is passed by Parliament is that relating to the overtaking of tramcars. These, says the Code, may be overtaken on the near side, and the advice given is to watch carefully to see if passengers are boarding or alighting before passing, and in any case to go slow. This is much too indefinite. Surely the inference, if passengers are about, is to stop. Why not say so, instead of leaving a vague implication that the motorist may drive through them, however slowly? As it stands it encourages discourtesy on the road, and many drivers now imagine they have done their duty if they use the horn in a threatening manner. A piece of advice to motor coach drivers is that when a number of coaches are travelling together they should keep well apart, so that faster traffic, after overtaking one vehicle, may draw in to the left if necessary before overtaking the next; and they are advised to keep habitually on the extreme left of the road, especially in the narrowest lanes. In view of the new speed limit for these vehicles this advice is all the more necessary. It is evident that the driver who wants to be efficient and to limit the risk of accident must master the practical details of the Code and determine to apply the rules in the spirit in which the whole Code is written. Although failure to observe any of its provisions will not in itself be an offence, any such failure may be relied upon by any party to proceedings, civil or criminal, to establish or negative liability. To this extent, at any rate, the Road Traffic Act gives the Code the backing of the law, so that drivers of all classes of vehicles should regard it as of greater import than simply a book of maxims.

## LONDON PASSENGER TRAFFIC BOARD.

### L.C.C. DISAGREE WITH THE GOVERNMENT PROPOSALS.

At the meeting of the London County Council on Tuesday last the Special Committee on Traffic reported on the proposals of the Government to establish a Passenger Transport Board for the London traffic area. The Government intended that the Board "would be such as would command the confidence of the investing public and the users of transport in London, and that proper contact should be maintained between the Board and public opinion." For the latter purpose the Minister of Transport proposed to utilise the statutory London and Home Counties Traffic Advisory Committee, but their functions would be advisory only. Important powers would be exercised by the Minister, in addition to his power of appointment of the Board. As to the stipulation of the Minister that the Board should "function as freely as possible from political interference so far as questions of management were concerned," the Committee were of opinion that management could not be disassociated from policy for this purpose, and that the proposals of the Minister to reserve important powers to himself were destructive of the principle which he regarded as of prime importance. The Committee did not accept the view that the Board should have unfettered decision of large questions of policy, subject only to formal appeal in the manner suggested. By "large questions of policy" they meant such questions as to whether a substantial surplus revenue over charges should be utilised for strengthening reserves, for lowering fares, for improving wages or conditions of service of staff, or for providing for the initial loss on extensions not immediately self-supporting or otherwise. Such a concentration of responsibility would be inconsistent with the practice of large business organisations, where the management ordinarily submitted to their board, of which they were frequently important members, broad questions of policy.

The report concluded by recommending that:—

(i) The proposals of the Government to vest large powers of ultimate control of policy of the transport services of the London Traffic Area in the hands of a Minister of State, and to exclude municipal representatives except in an advisory capacity, are contrary to sound principles of local government.

(ii) It is desirable that the management, as distinct from the determination of large policy, should be vested in a small number of persons of business and other qualifications to be defined by statute.

(iii) There should be a statutory obligation that the combined undertakings should be so conducted as to meet all proper charges from revenue.

(iv) The basis of acquisition of local authorities' undertakings should be not less favourable than that applied to privately-owned undertakings.

(v) The proposed basis of acquisition of the Council's tramway undertaking is inequitable and contrary to the interests of the Council and the ratepayers of the county of London.

The Finance Committee reported as follows on the foregoing recommendations:—

"As regards (i) we are not in a position to deal with the proposals of the Minister with respect to the basis of acquisition of privately-owned undertakings—the Minister having intimated that he desired that they should not be made public for the time being. Whatever form those proposals may finally take, we consider that as a matter of principle the terms offered to the Council should be not less favourable than those offered to privately-owned undertakings.

"As regards (ii) we regard it as inequitable that the Council should be required to part with the ownership of its undertaking on terms which preclude the rates from being recouped by amounts previously contributed from that source. As regards the proposals of the Minister that the Board shall assume responsibility for the service of the outstanding debt, i.e., for the charges for interest on and repayment of that debt, as distinct from the responsibility for the amount of the debt, we are strongly of opinion that the advantage which accrues to the undertaking by reason only of the financing operations in connection therewith being conducted in association with the larger operations of other services of the Council, should cease on severance of its association with those services."

### THE COUNCIL ADOPTS THE RECOMMENDATIONS.

Sir Oscar Warburg, proposing the adoption of the report, said that his committee attached great importance to the principle of public control and responsiveness to public opinion. In that respect the proposals of the Minister were insufficient. Local authorities should have a considerable voice, and he thought the proposal to vest the management in seven persons was wrong. Important powers might be delegated without necessarily entrusting

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the management with supreme control. In the case of a local authority's undertaking the basis of acquisition was to involve no profit and no loss. That would mean that an undertaking which cost £18,000,000 and was written down to £8,300,000 would be transferred at its book value. The proper basis should be the business value. The tramways had earned good gross profits, but during part of the time the profits were insufficient to meet the redemption of debt, with the result that recourse had to be made to the rates. On balance £1,250,000 was thus contributed by the rates. It would be an iniquity if money which really belonged to the ratepayers of London was transferred to the Traffic Board.

Mr. Angus Scott, seconding, said he could not see why the traffic of London should be handed over to Whitehall. The outstanding debt of £8,300,000 did not represent the full value of the tramways. The Council was reducing the debt at the rate of half a million a year. If Mr. Morrison was right and could delay his scheme for five years the terms on which he could acquire the tramways would be two and a half millions less than to-day. In arriving at any figure at which the tramways should be transferred the £1,250,000 contributed from the ratepayers which went towards debt redemption should be taken into account.

Mr. Percy Harris (Progressive) contended that if there must be a Traffic Board some of its members ought to be appointed by the Council.

Sir Wm. Ray (leader of the Council) said the proposals could not be discussed properly because the terms on which the Minister was to acquire private enterprises had not been disclosed. The Council had every right to expect that its tramways should not be treated on different terms from other undertakings. The proposals were a great menace to local government. A traffic authority should be local in its incidence rather than national.

After the defeat of several Socialist amendments, the recommendations were adopted by 70 votes to 32.

## MANCHESTER-ALTRINCHAM RAILWAY TRIAL RUN.

SUCCESSFUL TRIALS ON FIRST 1,500 VOLT D.C. LINE.

In connection with the electrification of the Manchester, South Junction and Altrincham Railway, which line is controlled jointly by the L.M.S. and L.N.E. Rlwys., a very successful trial run took place recently on the first length of track to be equipped. The test was attended by a number of officials of the two companies, and of the General Electric Co., Ltd., Magnet House, Kingsway, W.C.2, the contractors for the rolling stock electrical equipment. It is understood that the train operated in a highly satisfactory manner, a speed of nearly 60 m.p.h. being reached.

This being the first 1,500 volt D.C. multiple-unit train to be operated in this country, following the adoption of this voltage as standard by the Ministry of Transport, the successful performance attained is gratifying. The motors installed are the largest capacity axle-mounted traction motors as yet employed in this country, rating as they do at 328 b.h.p., each on the one-hour rating.

## BRADFORD TRANSPORT MANAGER.

MR. C. R. TATTAM APPOINTED.

At the meeting of Bradford Tramways Committee last Saturday, Mr. C. R. Tattam, manager of the Balfour-Beatty group of transport undertakings, was appointed general manager of the Corporation transport system.

Mr. Tattam, who is 45 years of age, is a native of Middlesex, and received his preliminary training in engineering at Tonbridge School. From 1902 he held various appointments, and in 1912 became manager of the Balfour-Beatty group, which operates nine tramway and omnibus undertakings in the provinces, with headquarters in London.

It was decided at Saturday's meeting of the Committee that Mr. Tattam should endeavour to obtain permission to leave his present position as early as possible in order to be free to take up duty in Bradford at the earliest opportunity.

## NEW PARLIAMENTARY BILLS.

Preston Corporation seeks powers to substitute trolleybuses for the tramways in the borough and the urban district of Fulwood, and power for the Minister of Transport to authorise further trolley vehicle routes within and without the borough.

Yorkshire (Woollen District) Electric Tramways are seeking powers to abandon certain tramways and light railways.

Bacup Corporation seeks powers to provide omnibuses within the borough and in the boroughs of Rawtenstall, Haslingden and Accrington, and for the abandonment of tramways, etc.

Southampton Corporation seeks powers to provide trolley vehicles on the tramway and other routes within and without the borough.

The London County Council's Bill includes tramway improvements at Vauxhall Cross and the construction of tramways in the Borough of Lambeth to enable the gyratory traffic system to be adopted.

Portsmouth Corporation seeks powers to restrict the running of omnibuses in competition with the Corporation's service.

**Question of Season Tickets in Glasgow.**—The decision on the question of the issue of season tickets on Glasgow Corporation omnibuses has been postponed until May next, the end of the financial year.

## MISCELLANEOUS NEWS AND NOTES.

**London General Omnibuses** will maintain a Sunday service up to 4 p.m. on Christmas Day. After that hour, a skeleton service will be maintained.

**Glasgow Transport Committee** has fixed 1d. per mile as the maximum fare to be taken from "artisans, mechanics and daily labourers" carried on the omnibuses.

**Ilkeston Tramways.**—Nottinghamshire and Derbyshire Traction Co., which works the Ilkeston Corporation tramways, has agreed with the Corporation to abandon the system.

**Plymouth Transport Committee** has decided to discontinue the foundry which has formed part of the department and in future orders for castings will be placed with private firms.

**Hull Town Council** has adopted the recommendation of the Tramways Committee for the purchase of eight omnibuses; four of these will have four cylinders and four will have six cylinders.

**Publicity for Municipal Transport.**—Glasgow Transport Committee has asked the general manager to consider and report as to the establishment of a publicity department in connection with the transport services.

**Requests for Shelters.**—In consequence of applications from tramcar and omnibus passengers for the provision of shelters, Bournemouth Tramways Committee has asked a sub-committee to report on the question generally.

**The Cost of Living.**—At December 1 the average level of retail prices compiled by the Ministry of Labour was approximately 55 per cent. above the level of July, 1914, as compared with 57 per cent. a month ago, and 67 per cent. a year ago.

**Decreased Revenue due to Fog.**—Glasgow Municipal Transport Committee estimates that the recent fog cost the department £1,000 a day in revenue, and £1,500 on Saturday, besides the cost of repairing over 200 damaged cars and other vehicles.

**Ayr Tramway Track.**—Prestwick town clerk has been instructed to bring before the Ayr Town Council the condition of the tramway track. A member of Prestwick Council said the tramways had become a menace mainly on account of the loop system.

**An Injunction.**—Swansea town clerk has reported to the Watch Committee that the action against W. Griffiths & Sons for an injunction to restrain them from plying for hire within the borough has been heard and judgment given for the Corporation, with costs.

**Hull Tramways Manager.**—The motion which was to have been moved by Councillor Woodliffe at the Hull City Council meeting on Tuesday rescinding the giving of notice to the tramways manager and two other officials was not reached on the agenda, and was left over.

**Manchester's Heavy Oil Omnibus in Service.**—The first Diesel engine omnibus to run in Manchester started on December 15 on the 53 route of the Corporation transport undertaking, from Cheetham Hill-road to Stretford-road. It is a double-deck Crossley vehicle.

**Tube Station Flooded.**—The bursting of a water main in Oxford-street at about 8.30 a.m. on December 15 disorganised traffic on the Central London and Edgware-Highgate lines for several hours. Tottenham Court-road Station was flooded and closed until the afternoon.

**An Aberdeen Tramway to be Abandoned.**—After an appeal had been heard for the retention of the Ferryhill tramway route, Aberdeen Town Council on December 15 decided by twenty votes to eight against the rescinding of its previous resolution to abandon the route. Omnibuses will be substituted.

**Railway Wages Deadlock.**—The representatives of the railway companies and the railway trade unions failed to reach any agreement yesterday regarding rates of pay and conditions of service. The questions will therefore be referred to the National Wages Board, which will meet under the chairmanship of Sir Harold Morris early in January.

**Manchester Christmas Services.**—On Christmas Day the service of Manchester Corporation tramways and omnibuses will be the same as on Sundays. On Christmas Eve and New Year's Eve they will continue until after midnight, and some of the all-night services will be duplicated. At no time during the holidays will any of the all-night services be suspended.

**Brighton Traffic Merger Bill.**—Brighton Town Council at two special meetings on Thursday considered again the promotion in Parliament of the Corporation's Traffic Merger Bill. The Council decided by 53 votes to 13 to take a poll of the town after Christmas on the subject of the Bill, which was rejected by a vote of 815 to 403 at a meeting of the ratepayers.

**Omnibuses at Rothesay.**—Rothesay Tramways Co. have received several new 32-seat omnibuses to be used on the route between Rothesay and Ettrick Bay. It is anticipated that the tramcar services will be discontinued from the beginning of the New Year until Glasgow spring holiday. The company has powers under a provisional order to substitute omnibuses for tramcars during the winter months.

**Southern Railway Orders Swedish Switchgear.**—It is reported that the Southern Railway authorities have decided to place a contract with a Swedish company for certain switchgear equipment required for the electrification of the London and Brighton line. The amount of the tender is approximately £65,000. The prices quoted by the Swedish firm are said to be nearly 50 per cent. below the lowest British tender. The B.E.A.M.A. will, it is understood, make representations to Sir Herbert Walker, general manager of the railway, in regard to the matter, as it is thought that the amount of the Swedish tender is below actual production costs.

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**Manchester and Trolleybuses.**—The deputation of Manchester Transport Committee which visited a number of towns to inspect trolleybus installations has submitted a report, following which the Corporation has decided not to seek powers to run trolleybuses. Councillor I. Brassington, chairman of the Committee, states that the idea has not been definitely rejected, and that it can be examined later.

**Rawtenstall to have Separate Tramway Manager.**—The Rawtenstall Corporation has decided to separate the posts of electrical engineer and tramway manager. Mr. C. L. E. Stewart, who has held the combined posts for twenty-one years, will confine his duties to the electrical undertaking and a new tramway manager will be appointed. A special sub-committee has been appointed to consider the two appointments.

**Renewal of Vehicle Licences.**—The Ministry of Transport has issued a reminder that approximately 2½ million motor vehicle licences will expire on December 31, and that licences may be renewed as from December 17. All vehicles must now be insured against third-party risks. The rates of duty payable as from July 1, 1930, in respect of goods vehicles between 2 tons and 2½ tons in weight unladen, have been amended by the provisions of the Finance Act, 1930, and vehicles propelled by petrol-electric engines must be reclassified.

**Belfast Tramways Managership.**—Belfast Corporation Tramways Committee has decided that the person appointed to succeed Mr. W. Chamberlain as general manager of the transport department must, in addition to having technical qualifications in tramway and omnibus management and engineering, possess high administrative ability. He must also have wide experience of the control and management of combined tramway and omnibus undertakings. The selected candidate is to be asked to state what salary he would be prepared to accept.

**Omnibus Wages at Glasgow.**—The Transport Committee of Glasgow Corporation has considered an application by the Transport and General Workers' Union for a new scale of wages for omnibus drivers and conductors, and has recommended the following scales, which give an increase of 1s. per week on the maximum of the existing scales :—Drivers : First six months, 60s. per week ; second six months, 62s. ; third six months, 64s. ; fourth six months, 66s. ; thereafter, 67s. Conductors : First year, 55s. per week ; second year, 57s. ; third year, first six months, 59s. per week ; second six months, 60s. ; thereafter, 61s.

**Free State Transport Mergers.**—The "Times" correspondent in Dublin telegraphing on Thursday stated that it is believed that as soon as the Dail Eireann meets in February a comprehensive Transport Bill will be introduced by the Irish Free State Government. The suggestion is that complete control of all passenger and goods traffic in the area served by the Great Southern Railway shall be transferred to the company with omnibus services as feeders, and that like powers shall be given to the Dublin United Tramways Co. in respect of the Metropolitan area. At present the railway company is suffering heavy losses as a result of the competition of individual lorry owners who ply between Free State towns carrying goods at uneconomic rates, and although the railway company has a working agreement with the Irish Omnibus Co., privately-owned omnibuses are capturing much of the passenger traffic. The Great Southern Railway Co. has been pressing for legislation during recent months, and although no final decision has been taken, some form of Transport Bill seems to be certain.

## CHAIRMEN OF THE TRAFFIC COMMISSIONERS.

In the House of Commons on Wednesday, Mr. H. Morrison, Minister of Transport, announced that he had appointed Mr. J. Farndale, C.B.E., Chief Constable of Bradford, to be chairman of the Traffic Commissioners for the Yorkshire Area. Sir Haviland Hiley, K.B.E., whose appointment without specified district he had already announced, would be chairman of the Eastern area. The previous appointments were detailed in our last issue, and with the above additions the list of chairmen is now complete except for the Metropolitan area.

## L.C.C. TRAMWAY MATTERS.

ONE HUNDRED CARS TO BE FITTED WITH MOTORMEN'S SCREENS.

The London County Council, at their meeting last Tuesday, decided, on the recommendation of the Highways Committee, to equip the platforms of one hundred cars with vestibule front screens, the metal frames to be filled with suitable safety glass. The cost was estimated at £157 per car, or a total of £15,700. The decision was the result of experiments in providing protection during inclement weather. The committee stated that it would be more economical for the work to be executed by direct employment of labour in the tramways department.

COST OF THE SUBWAY ENLARGEMENT.

On November 26, 1929, the Council passed an estimate of £326,500 in respect of the enlargement of the subway from the Victoria-embankment to Southampton-row, the conversion of fifty single-deck cars to double-deck for use in the subway, and the reconstruction of the conduit system tramways therein. Later the estimate was reduced to £312,875, as the whole of the money was not spent during the financial year. For the year 1930-31 a supplemental capital vote of £25,000 is necessary. The additional vote was agreed to.

## PERSONAL.

**Mr. A. H. Todd,** of Accrington, has been appointed electrical engineer to Clitheroe Corporation.

**Mr. Alex. Cramb,** engineer and manager of Croydon Corporation electricity undertaking, and advising electrical engineer to the Corporation Tramways, has been appointed director of the British Electrical Development Association.

**Mr. P. W. Bancroft,** manager of Derby Corporation Transport, has been elected president of the Derby branch of the National Association of Local Government Officers, in succession to Mr. G. H. Lake, now electrical engineer at Nottingham.

**Mr. A. F. Nicholson,** chief constable of Exeter, who has been appointed chairman of the Traffic Commissioners for the Western area of England, started as a constable in Bradford in 1895. He went to Exeter in 1913 after attaining the appointment of chief clerk and superintendent at Bradford.

**Sir Felix J. Pole,** chairman of Associated Electrical Industries, Ltd., has been appointed a member of the Coal Mines Reorganisation Commission. Sir Felix and also **Sir Francis Dunnel,** formerly chief legal adviser of the L.N.E. Railway, have been appointed to the panel of arbitrators under the coal mines marketing scheme of the 1930 Act.

**Mr. W. N. Colam,** who as a consulting engineer designed and supervised the installation of the cable tramways in Edinburgh in 1890 and later, has died at Hove.

**Alderman C. W. Matthews,** who until March last was chairman of the Highways Committee of the London County Council, died on December 17 at Kingston, Jamaica. On November 28 the Alderman left his residence, "Brookfield," West Hill, Highgate, with the intention of spending the winter at Kingston. He was 78 years of age, and was a Deputy-Lieutenant of the County of London and an ex-Mayor of St. Pancras. Besides serving on the L.C.C. since 1929 he was for many years a member of the Metropolitan Water Board and of the London and Home Counties Traffic Advisory Committee.

## FINANCIAL ITEMS.

**Yorkshire (West Riding) Electric Tramways Co., Ltd.**—The directors have decided to pay a final dividend on the 6 per cent. cumulative preference shares of 3 per cent. (at the rate of 6 per cent. per annum) for the half-year ending December 31.

**David Brown & Sons (Huddersfield), Ltd.**—The net profit for the year ended September 30 was £87,159. It is proposed to pay a dividend of 10 per cent., tax free, on ordinary shares, including 30,000 shares issued during the year, ranking as from January 1 last. The balance carried forward is increased to £117,287.

**L.C.C. Tramways Receipts.**—The traffic receipts for the week ended December 17 amounted to £85,327, a decrease of £3,309 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to December 17 (37 2-7 weeks) the total receipts were £3,086,225, a decrease of £47,290.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended November 29 gave total receipts of £413,312, or £7,590 less than in the corresponding week of last year. The aggregate receipts for thirty-five weeks amounted, with certain adjustments, to £14,757,650, showing an increase of £109,796 over the corresponding period of last year.

## CONTRACTS.

**Witham Urban Council** has purchased a Morris-Commercial fire-engine.

**Plymouth Council** has placed a contract for switchgear with A. Reyrolle & Co.

**Bury Corporation** has purchased a heavy duty geared engine stand from the Equipment and Engineering Co., Ltd.

**Brighton Tramways Committee** has accepted the tender, £1,215, of Rego Clothiers, Ltd., for the supply of uniforms.

**Birkenhead Tramways Committee** has recommended the purchase of twelve motor omnibuses at an estimated cost of £22,000.

**Thomas Tilling, Ltd.,** have placed a repeat order for an Eqwhipple engine starter with the Equipment and Engineering Co., Ltd.

**Sunderland Corporation Tramways** have ordered an Eqwhipple engine starter from the Equipment and Engineering Co., Ltd.

**Wolverhampton Corporation** has placed an order for Hammond petrolling plant with the Equipment and Engineering Co., Ltd.

**Stockton Corporation** has accepted the tender of the Brush Electrical Engineering Co., Ltd., for the supply of two transformers.

**Grimsby Council** has been recommended by the Electricity Committee to accept the tender of the Metropolitan-Vickers Electrical Co., Ltd., for the supply of switchgear, at £5,580.

**Lowestoft Transport Committee** has recommended acceptance of the tender of the Associated Equipment Co., Ltd., for eight double-deck omnibus chassis at £960 each, one to be fitted with a heavy oil engine at an additional cost of £240. The Committee has accepted the tender of Guy Motors, Ltd., for chassis for four saloon omnibuses at £854 each. The bodies of the double-deck omnibuses are to be of the quick-loading type with straight staircase, as demonstrated by the Associated Equipment Co., Ltd., but tenders are to be invited locally for the building of the bodies of all vehicles.

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**The Equipment and Engineering Co., Ltd.,** have orders from Blackburn, Stockport and Yorkshire (W.D.) Electric Tramways for Tec-Luchard portable pressure greasing outfits.

**J. W. Courtenay, Ltd.,** of Amberley House, Norfolk-street, London, W.C., have been appointed sole advertising contractors for the new double-deck omnibuses of Southampton Corporation.

**Doncaster Tramways Committee** has recommended the Corporation to accept the tender of Clough, Smith & Co., Ltd., 36, Victoria-street, S.W.1, for the supply of ten Karrier-Clough trolley-buses at £19,750.

**The Associated Equipment Co.** is supplying to Stockton Corporation a double-deck omnibus fitted with a heavy oil engine, subject to an undertaking to substitute a petrol engine at a period not exceeding three months if the Council is not satisfied with the oil engine. The A.E.C. has also an order for a "Regal" single-deck omnibus for Stockton Corporation.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | Dec. 16 | 611 | 576 | — 35 | 37 | 21,788 | — 252 |
| „ Motor Buses ... | „ 16 | 298 | 316 | + 18 | 37 | 11,263 | + 1,897 |
| „ Total ... ... | „ 16 | 909 | 892 | — 17 | 37 | 33,051 | + 1,645 |
| Aberdeen Corp. ... | „ 10 | 4,421 | 4,367 | — 54 | 27½ | 145,000 | + 2,548 |
| Ashton-u-Lyne Corp. | „ 6 | 901 | 755 | — 146 | 36 | 30,319 | — 2,748 |
| „ Motor Buses ... | „ 6 | 463 | 457 | — 6 | 36 | 17,737 | + 188 |
| „ Trolley Buses ... | „ 6 | 290 | 243 | — 47 | 36 | 9,319 | — 814 |
| „ Total ... ... | „ 6 | 1,654 | 1,455 | — 199 | 36 | 57,375 | — 3,374 |
| Ayr Corporation ... | „ 13 | 456 | 383 | — 73 | 30 | 17,731 | — 1,479 |
| Barrow Corporation... | „ 13 | 552 | 511 | — 41 | 37 | 21,178 | — 1,217 |
| „ Motor Buses ... | „ 13 | 348 | 356 | + 8 | 37 | 15,134 | + 591 |
| „ Total ... ... | „ 13 | 900 | 867 | — 33 | 37 | 36,312 | — 626 |
| Belfast City ... ... | „ 12 | 11,358 | 11,513 | + 155 | 36½ | 420,872 | + 11,861 |
| „ Motor Buses ... | „ 12 | 1,259 | 1,402 | + 143 | 36½ | 48,331 | + 8,982 |
| „ Total ... ... | „ 12 | 12,617 | 12,915 | + 298 | 36½ | 469,203 | + 20,843 |
| Birkenhead Corp. ... | „ 14 | 1,556 | 1,363 | — 193 | 37 | 55,471 | — 6,457 |
| „ Motor Buses ... | „ 14 | 3,194 | 3,653 | + 459 | 37 | 139,587 | + 5,523 |
| „ Total ... ... | „ 14 | 4,750 | 5,016 | + 266 | 37 | 195,058 | — 934 |
| Birmingham Corp. ... | „ 9 | 28,041 | 25,613 | — 2,428 | 36 | 939,483 | — 53,412 |
| „ Motor Buses ... | „ 9 | 14,133 | 16,501 | + 2,368 | 36 | 566,384 | + 85,409 |
| „ Trolley Buses ... | „ 9 | 612 | 530 | — 82 | 36 | 19,349 | — 992 |
| „ Total ... ... | „ 9 | 42,786 | 42,644 | — 142 | 36 | 1,525,216 | + 31,005 |
| Blackburn Corp. ... | „ 10 | 1,805 | 1,564 | — 241 | 36½ | 65,182 | — 6,109 |
| „ Motor Buses ... | „ 10 | 338 | 333 | — 5 | 36½ | 11,791 | ... |
| „ Total ... ... | „ 10 | 2,143 | 1,897 | — 246 | 36½ | 76,973 | ... |
| Bradford Corporation | „ 13 | 9,783 | 8,710 | — 1,073 | ... | ... | ... |
| „ Motor Buses ... | „ 13 | 3,328 | 2,945 | — 383 | ... | ... | ... |
| „ Trolley Buses ... | „ 13 | 1,383 | 1,809 | + 426 | ... | ... | ... |
| „ Miscellaneous ... | „ 13 | 1,491 | 1,471 | — 20 | ... | ... | ... |
| „ Total ... ... | „ 13 | 15,985 | 14,935 | — 1,050 | 36 | 529,047 | — 21,472 |
| Brighton Corporation | „ 14 | 2,191 | 2,105 | — 86 | 36½ | 100,924 | + 1,345 |
| Burnley Corporation... | „ 13 | 3,262 | 2,703 | — 559 | ... | ... | ... |
| „ Motor Buses ... | „ 13 | 698 | 768 | + 70 | ... | ... | ... |
| „ Total ... ... | „ 13 | 3,960 | 3,471 | — 489 | ... | ... | ... |
| Bury Corporation ... | „ 14 | 1,920 | 1,459 | — 461 | 36½ | 63,722 | — 10,558 |
| „ Motor Buses ... | „ 14 | 853 | 1,297 | + 444 | 36½ | 45,095 | + 24,708 |
| „ Total ... ... | „ 14 | 2,773 | 2,756 | — 17 | 36½ | 108,817 | + 14,150 |
| Cardiff Corporation ... | „ 13 | 7,943 | 7,483 | — 460 | 36½ | 285,727 | + 1,006 |
| Chester Corporation ... | „ 14 | 420 | Nil | — 420 | 37 | Nil | — 16,155 |
| „ Motor Buses ... | „ 14 | Nil | 650 | + 650 | 37 | 24,678 | + 24,678 |
| „ Total ... ... | „ 14 | 420 | 650 | + 230 | 37 | 24,678 | + 8,523 |
| Chesterfield Corp. ... | „ 15 | 2,082 | 1,991 | — 91 | 37 | 71,757 | + 554 |
| Colchester Corp. ... | „ 17 | 609 | 601 | — 8 | 38 | 22,918 | + 2,002 |
| Colne Corporation ... | „ 17 | 700 | 625 | — 75 | 37 | 25,900 | — 625 |
| Coventry Corporation | „ 14 | 2,341 | 1,978 | — 363 | 37 | 71,699 | — 7,582 |
| „ Motor Buses ... | „ 14 | 1,902 | 1,973 | + 71 | 37 | 66,592 | + 6,266 |
| „ Total ... ... | „ 14 | 4,243 | 3,951 | — 292 | 37 | 138,291 | — 1,316 |
| Darlington Corp. ... | „ 13 | 1,033 | 1,046 | + 13 | 36½ | 38,930 | + 2,589 |
| Derby Corporation ... | „ 13 | 2,515 | 2,096 | — 419 | 37 | 88,650 | — 4,453 |
| „ Motor Buses ... | „ 13 | 883 | 1,138 | + 255 | 37 | 34,846 | + 7,065 |
| „ Total ... ... | „ 13 | 3,398 | 3,234 | — 164 | 37 | 123,496 | + 2,612 |
| Dover Corporation ... | „ 13 | 369 | 359 | — 10 | 37 | 15,953 | + 443 |
| Dundee Corporation... | Nov. 25 | 2,574 | 2,500 | — 74 | 27½ | 70,804 | — 2,369 |
| „ Motor Buses ... | „ 25 | 832 | 1,151 | + 319 | 27½ | 31,730 | + 8,331 |
| „ Total ... ... | „ 25 | 3,406 | 3,651 | + 245 | 27½ | 102,534 | + 5,962 |
| East Ham Corp. ... | Dec. 13 | 2,433 | 2,261 | — 172 | 36½ | 83,673 | — 541 |
| Edinburgh Corp. ... | „ 6 | 14,232 | 14,130 | — 102 | 29½ | 436,193 | + 6,887 |
| „ Motor Buses ... | „ 6 | 3,476 | 3,627 | + 151 | 29½ | 111,080 | + 8,463 |
| „ Total ... ... | „ 6 | 17,708 | 17,757 | + 49 | 29½ | 547,273 | + 15,350 |
| Exeter Corporation ... | „ 17 | 834 | 735 | — 99 | 38 | 29,753 | — 3,064 |
| „ Motor Buses ... | „ 17 | 219 | 414 | + 195 | 38 | 13,168 | + 7,042 |
| „ Total .. ... | „ 17 | 1,053 | 1,149 | + 96 | 38 | 42,921 | + 3,978 |
| Glasgow Corporation... | „ 13 | 46,088 | 42,482 | — 3,606 | 28 | 1,211,001 | — 25,852 |
| „ Motor Buses ... | „ 13 | 7,007 | 10,766 | + 3,759 | 28 | 257,376 | + 94,977 |
| „ Total ... ... | „ 13 | 53,095 | 53,248 | + 153 | 28 | 1,468,377 | + 69,125 |
| Gloucester Corp. ... | „ 10 | 672 | 699 | + 27 | 36½ | 26,213 | + 4,676 |
| Grimsby Corporation | „ 13 | 1,507 | 1,549 | + 42 | 37 | 59,045 | + 5,533 |
| Halifax Corporation | „ 9 | 5,024 | 4,741 | — 283 | 36½ | 186,359 | + 17,224 |
| Huddersfield Corp. ... | „ 13 | 6,426 | 5,963 | — 463 | 37 | 235,032 | — 3,243 |
| Hull Corporation ... | „ 13 | 6,392 | 5,803 | — 589 | 37 | 212,655 | — 10,489 |
| „ Motor Buses ... | „ 13 | 1,553 | 1,834 | + 281 | 37 | 61,104 | + 9,729 |
| „ Total ... ... | „ 13 | 7,945 | 7,637 | — 308 | 37 | 273,759 | — 760 |
| Ilford Corporation ... | „ 13 | 1,589 | 1,552 | — 37 | 36½ | 55,927 | + 714 |
| Ipswich Corp. Trol.Bus | „ 13 | 1,328 | 1,299 | — 29 | 36½ | 50,089 | + 2,412 |
| Isle of Thanet ... | „ 10 | 357 | 322 | — 35 | 49½ | 39,950 | — 4,646 |
| Kilmarnock Corp. ... | „ 13 | 505 | 528 | + 23 | 30½ | 15,091 | + 580 |
| Lancashire Un. ... | Nov. 30 | 4,374 | 4,604 | + 230 | 47½ | 237,318 | + 28,460 |
| „ Motor Buses ... | „ 30 | 2,313 | 2,157 | — 156 | 47½ | 101,978 | — 5,869 |
| Leeds Corporation ... | Dec. 13 | 19,809 | 19,306 | — 503 | 36½ | 732,792 | + 10,141 |
| Leicester Corp. ... | „ 13 | 8,852 | 8,470 | — 382 | 37 | 309,796 | — 1,484 |
| Lincoln Corp. ... | Nov. 30 | 906 | 858 | — 48 | 35 | 32,752 | + 175 |
| Liverpool Corp. ... | Dec. 10 | 27,237 | 25,700 | — 1,537 | 36½ | 970,364 | — 20,045 |
| „ Motor Buses ... | „ 10 | 3,270 | 3,320 | + 50 | 36½ | 120,191 | + 15,976 |
| „ Total ... ... | „ 10 | 30,507 | 29,020 | — 1,487 | 36½ | 1,090,555 | — 4,069 |
| London County Coun. | „ 17 | 88,636 | 85,327 | — 3,309 | 37½ | 3,086,225 | — 47,290 |
| Luton Corporation ... | „ 10 | 403 | 356 | — 47 | 36½ | 15,257 | + 195 |
| Maidstone Corp. ... | „ 11 | 128 | Nil | — 128 | 36½ | Nil | — 7,380 |
| „ Motor Buses ... | „ 11 | 344 | 247 | — 97 | 36½ | 10,095 | — 1,415 |
| „ Trolley Buses ... | „ 11 | 284 | 515 | + 231 | 36½ | 22,135 | + 10,945 |
| „ Total ... ... | „ 11 | 756 | 762 | + 6 | 36½ | 32,230 | + 2,150 |
| Manchester Corp. ... | „ 13 | 36,105 | 31,231 | — 4,874 | 37 | 1,180,922 | — 114,026 |
| „ Motor Buses ... | „ 13 | 4,902 | 9,363 | + 4,461 | 37 | 325,849 | + 143,212 |
| „ Total ... ... | „ 13 | 41,007 | 40,594 | — 413 | 37 | 1,506,771 | + 29,186 |
| Middlesbrough Corp. | „ 9 | 1,203 | 938 | — 265 | 36½ | 36,827 | — 4,488 |
| „ Motor Buses ... | „ 9 | 589 | 535 | — 54 | 36½ | 20,447 | + 1,114 |
| „ Total ... ... | „ 9 | 1,792 | 1,473 | — 319 | 36½ | 57,274 | — 3,374 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name. | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Ty.Corp. | Dec. 13 | 9,577 | 8,317 | — 1,260 | 36½ | 316,797 | — 52,791 |
| „ Motor Buses ... | „ 13 | 1,924 | 3,669 | + 1,745 | 36½ | 121,005 | + 46,395 |
| „ Total ... ... | „ 13 | 11,501 | 11,986 | + 485 | 36½ | 437,802 | — 6,396 |
| Newport Corporation | „ 6 | 1,729 | 1,037 | — 692 | 36 | 49,713 | — 10,488 |
| „ Motor Buses ... | „ 6 | 764 | 1,234 | + 470 | 36 | 36,972 | + 9,696 |
| „ Total ... ... | „ 6 | 2,493 | 2,271 | — 222 | 36 | 86,685 | — 792 |
| Northampton Corp. ... | „ 12 | 1,148 | 746 | — 402 | 36½ | 35,162 | — 5,762 |
| „ Motor Buses ... | „ 12 | 664 | 1,046 | + 382 | 36½ | 31,758 | + 7,099 |
| „ Total ... ... | „ 12 | 1,812 | 1,792 | — 20 | 36½ | 66,920 | + 1,337 |
| Nottingham Corp. ... | „ 11 | 6,448 | 5,359 | — 1,089 | 36½ | 209,783 | — 31,890 |
| „ Motor Buses ... | „ 11 | 2,874 | 3,485 | + 611 | 36½ | 125,187 | + 35,976 |
| „ Trolley Buses ... | „ 11 | 619 | 1,149 | + 530 | 36½ | 43,827 | + 21,927 |
| „ Total ... ... | „ 11 | 9,941 | 9,993 | + 52 | 36½ | 378,797 | + 26,013 |
| Oldham Corporation | „ 13 | 3,704 | 3,260 | — 444 | 38 | 126,789 | — 9,008 |
| „ Motor Buses ... | „ 13 | 2,013 | 1,786 | — 227 | 38 | 74,225 | — 1,990 |
| „ Total ... ... | „ 13 | 5,717 | 5,046 | — 671 | 38 | 201,014 | — 10,998 |
| Plymouth Corp. ... | „ 13 | 3,697 | 3,202 | — 495 | 36½ | 132,253 | — 8,011 |
| „ Motor Buses ... | „ 13 | 2,189 | 2,841 | + 652 | 36½ | 93,834 | + 20,435 |
| „ Total ... ... | „ 13 | 5,886 | 6,043 | + 157 | 36½ | 226,087 | + 12,424 |
| Portsmouth Corp. ... | „ 13 | 3,954 | 3,373 | — 581 | 37 | 155,051 | — 14,948 |
| „ Motor Buses ... | „ 13 | 1,840 | 2,919 | + 1,079 | 37 | 123,112 | + 47,332 |
| „ Total ... ... | „ 13 | 5,794 | 6,292 | + 498 | 37 | 278,163 | + 32,384 |
| Preston Corporation... | „ 10 | 1,742 | 1,488 | — 254 | 36½ | 60,485 | — 2,864 |
| „ Motor Buses ... | „ 10 | 522 | 466 | — 56 | 36½ | 18,830 | + 663 |
| „ Total ... ... | „ 10 | 2,264 | 1,954 | — 310 | 36½ | 79,315 | — 2,201 |
| Rawtenstall Corp. ... | „ 7 | 919 | 611 | — 308 | 35½ | 23,189 | — 7,312 |
| „ Motor Buses ... | „ 7 | 515 | 668 | + 153 | 35½ | 21,993 | + 6,250 |
| „ Total ... ... | „ 7 | 1,434 | 1,279 | — 155 | 35½ | 48,182 | — 1,062 |
| Reading Corporation | „ 11 | 1,613 | 1,418 | — 195 | 37 | 52,859 | — 3,096 |
| „ Motor Buses ... | „ 11 | 953 | 1,039 | + 86 | 37 | 37,418 | + 3,663 |
| „ Total ... ... | „ 11 | 2,566 | 2,457 | — 109 | 37 | 90,277 | + 567 |
| Rochdale Corp. ... | „ 13 | 2,863 | 2,116 | — 747 | ... | 97,182 | — 10,196 |
| „ Motor Buses ... | „ 13 | 1,612 | 2,113 | + 501 | ... | 62,303 | + 3,996 |
| „ Total ... ... | „ 13 | 4,475 | 4,229 | — 246 | ... | 159,485 | — 6,200 |
| Rotherham Corp. ... | „ 15 | 2,766 | 2,670 | — 96 | 37 | 102,813 | + 2,009 |
| Salford Corporation ... | „ 14 | 11,720 | 11,027 | — 693 | 36½ | 411,183 | — 3,448 |
| Sheffield Corp. ... | „ 13 | 21,929 | 19,955 | — 1,974 | 36½ | 749,530 | — 29,777 |
| Southampton Corp. ... | „ 10 | 3,523 | 3,226 | — 297 | 37 | 127,672 | + 1,891 |
| „ Motor Buses ... | „ 10 | 930 | 813 | — 117 | 37 | 32,094 | + 2,721 |
| „ Total ... ... | „ 10 | 4,453 | 4,039 | — 414 | 37 | 159,766 | + 4,612 |
| Southend-on-Sea Corp. | „ 10 | 1,779 | 1,636 | — 143 | 36½ | 80,386 | — 3,861 |
| „ Trolley Buses ... | „ 10 | 193 | 213 | + 20 | 36½ | 11,467 | + 3,378 |
| „ Total ... ... | „ 10 | 1,972 | 1,849 | — 123 | 36½ | 91,853 | — 483 |
| Southport Corp. ... | „ 13 | 1,204 | 1,135 | — 69 | 36½ | 49,618 | — 799 |
| „ Motor Buses ... | „ 13 | 321 | 326 | + 5 | 36½ | 15,699 | + 1,341 |
| „ Total ... ... | „ 13 | 1,525 | 1,461 | — 64 | 36½ | 65,317 | + 542 |
| St. Helens Corp. ... | „ 9 | 2,047 | 2,049 | + 2 | 36½ | 74,447 | + 3,573 |
| Sunderland Corp. ... | „ 16 | 2,441 | 2,098 | — 343 | 37 | 88,930 | — 2,306 |
| „ Motor Buses ... | „ 16 | 296 | 720 | + 424 | 37 | 23,310 | + 14,617 |
| „ Total ... ... | „ 16 | 2,737 | 2,818 | + 81 | 37 | 112,240 | + 12,311 |
| Swindon Corp. ... | „ 10 | 924 | 938 | + 14 | 36½ | 35,967 | + 6,422 |
| Wallasey Corp. ... | „ 13 | 1,183 | 1,066 | — 117 | 36½ | 45,343 | — 3,757 |
| „ Motor Buses ... | „ 13 | 1,894 | 1,976 | + 82 | 36½ | 85,821 | + 7,660 |
| „ Total ... ... | „ 13 | 3,077 | 3,042 | — 35 | 36½ | 131,164 | + 3,903 |
| Walsall Corporation... | „ 7 | 3,585 | 3,717 | + 132 | 36 | 127,671 | + 4,066 |
| Walthamstow Corp. ... | „ 13 | 2,511 | 2,369 | — 142 | 36½ | 90,597 | — 796 |
| Warrington Corp. ... | „ 14 | 963 | 906 | — 57 | 37 | 32,998 | + 78 |
| „ Motor Buses ... | „ 14 | 525 | 517 | — 8 | 37 | 18,728 | + 1,922 |
| „ Total ... ... | „ 14 | 1,488 | 1,423 | — 65 | 37 | 51,726 | + 2,000 |
| West Ham Corp. ... | „ 11 | 6,479 | 5,873 | — 606 | 36½ | 219,688 | — 3,119 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | „ 7 | 2,740 | 2,130 | — 610 | 36 | 86,841 | — 14,014 |
| „ Trolley Buses ... | „ 7 | 3,470 | 3,556 | + 86 | 36 | 126,061 | + 5,251 |
| „ Total ... ... | „ 7 | 6,210 | 5,686 | — 524 | 36 | 212,902 | — 8,763 |
| York Corporation ... | „ 10 | 1,049 | 878 | — 171 | 37 | 37,736 | — 1,204 |
| „ Motor Buses ... | „ 10 | 499 | 516 | + 17 | 37 | 19,257 | + 4,315 |
| „ Trolley Buses ... | „ 10 | 66 | Nil | — 66 | 37 | Nil | — 2,090 |
| „ Total ... ... | „ 10 | 1,614 | 1,394 | — 220 | 37 | 56,993 | + 1,021 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Wks. or *M* | Aggregate. 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Dec. 16 | £88,839 | £79,952 | 50 w | £4,081,400 | — £249,928 |
| Brazilian Traction $ | Oct. | 4,289,258 | 3,714,677 | 10 m | 39,781,024 | —1,440,030 |
| British Columbia $ | Oct. | 1,230,278 | 1,248,830 | 4 m | 4,846,038 | + 121,008 |
| Buenos Aires Lacroze | Dec. 14 | 13,071 | 12,222 | 24 w | 269,539 | — 15,287 |
| Burma E. Sup. Co. Rs. | Nov. | 59,295 | 61,401 | 4 m | 258,599 | + 21,482 |
| Calcutta ... Rs. | Dec. 13 | 128,205 | 102,892 | 49½ w | 5,426,486 | — 858,151 |
| Cape Town ... ... | Oct. | 27,501 | 25,312 | ... | ... | — |
| Carthagena & Herrerias | Nov. | 1,350 | 553 | 11 m | 8,404 | — 3,649 |
| Durban Corporation | Oct. | 24,320 | 22,693 | 3 m | 68,920 | — 3,390 |
| East India ... ... | Nov. | 3,905 | 3,507 | 4 m | 14,995 | — 1,266 |
| Kalgoorlie ... ... | Sept. | 1,980 | 2,061 | 9 m | 15,833 | + 228 |
| Madras (2 weeks) Rs. | Dec. 15 | 43,326 | 45,347 | 48 w | 1,054,543 | + 50,083 |
| Para ... ... | Oct. | 17,887 | 12,110 | 11 m | 155,610 | — 10,803 |
| Port Elizabeth ... | Oct. | 7,593 | 6,904 | ... | ... | .. |
| Rangoon ... Rs. | Nov. | 137,703 | 154,965 | 11 m | 1,658,280 | + 309,994 |
| Shanghai ... $ | Nov. | 360,247 | 430,394 | 11 m | 3,974,052 | + 246,145 |
| Singapore ... ...$ | Nov. | 126,000 | 134,000 | 2 m | 276,000 | + 17,000 |
| Winnipeg ... ...$ | Oct. | 545,308 | 523,660 | 10 m | 5,179,893 | — 216,591 |

## RAILWAY RECEIPTS.

| 50th Week ended Dec. 14th | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 192,000 | — 17,000 | 325,000 | — 23,000 | 517,000 | — 40,000 | -1,399,000 |
| L.M.S R. | 440,000 | — 26,000 | 811,000 | — 92,000 | 1,251,000 | — 118,000 | -4,831,000 |
| L.N.E R. | 295,000 | — 11,000 | 680,000 | — 40,000 | 975,000 | — 51,000 | -3,145,000 |
| S.R. | 259,000 | — 14,000 | 109,000 | + 1,000 | 368,000 | — 13,000 | — 593,000 |
| Totals | 1,186,000 | — 68,000 | 1,925,000 | — 154,000 | 3,111,000 | — 222,000 | -9,968,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Nov. 13 | 303,100 | 303,300 | + 200 | 15,080,100 | + 750,600 |
| Lond. & Sub. Group | „ 13 | 44,900 | 44,300 | — 600 | 2,219,000 | + 113,800 |
| Metropolitan Railway | „ 13 | 37,500 | 36,700 | — 800 | 1,821,700 | + 5,900 |
| Liverpool Overhead | „ 14 | 1,669 | 1,397 | — 272 | 76,965 | — 7,337 |
| Mersey Railway ... | „ 13 | 4,903 | 4,856 | — 47 | 226,532 | + 3,246 |

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THE
# Tramway AND Railway World

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LONDON, DECEMBER 27, 1930.

## MOTOR COACH RESTRICTIONS IN LONDON.

The problem of London's traffic increases in complexity. It is, moreover, a problem which must be considered as a whole, and no half-measures hurriedly decided on will bring order out of the present chaos. A constructive policy for the regulation of all classes of traffic is needed; but before that can be worked out the constitution of the Traffic Board, foreshadowed in the Bill to be presented to Parliament next session, is essential. The grouping of the public passenger-carrying interests will to some extent simplify the question. The appointment under the Road Traffic Act of the Traffic Commissioner for the Metropolitan area will advance the solution a stage further by unifying powers now held by various authorities. In the meanwhile the precipitate action of the Minister of Transport in proposing the prohibition of motor-coach traffic within certain areas is to be deprecated. It is difficult to see on what grounds such a proposal can be justified even though made on the advice of the Advisory Board, and it would seem that considerations other than those bearing directly on the subject have brought about the decision. The public highway is common property and is available to all vehicles for the purpose of movement. The use of streets as parking places for coaches is, however, a source of inconvenience and a cause of congestion, and had the Minister confined his proposals to the "moving on" of these loiterers no objections could have been levelled against them. If congestion occurs, as is certainly the case, in some of the principal London streets through the mere presence of moving vehicles, restrictions should logically be applied to all, but to single out one particular class is both unjust and in this case ill-advised. In point of fact it is doubtful whether motor-coaches, which work to a time-table and are driven by competent drivers, cause anything like the congestion attributable to horse-drawn lorries, delivery vans, crawling taxicabs, or private cars. With equal fairness any one of these categories might be forbidden the use of the roads. But because the motor-coach is the last-comer and because there still lingers some of the prejudice engendered by its cumbersome forebears before the age of pneumatic tyres and silent running engines, its removal is decreed. Motor-coaches are now fulfilling a real need as they provide a rapid and comfortable means of conveyance from the suburbs to the centre, and in some cases to the opposite side, of the Metropolis. This is a service which the public can ill afford to lose, and both they and the coach operators are rightly insisting on the fullest justification of the Minister's proposals before they take effect.

## ACCIDENTS TO TRAMWAY PASSENGERS.

SAFEGUARDS IN THE HIGHWAY CODE.

Correspondence between Mr. Herbert Morrison, Minister of Transport, and Mr. Holford Knight, K.C., M.P. (Recorder of West Ham), was issued to-day (Saturday). Mr Knight drew attention to the frequency of accidents caused by vehicles overtaking passengers being taken on or set down by tramway cars and buses, and suggested that the matter should be dealt with in the Highway Code or by the powers of the Minister under the Road Traffic Act to make additional Orders on application by a town or district council.

In his reply, Mr. Morrison quotes the following paragraph from the draft Highway Code:—

> Subject to any local provisions to the contrary, tramway cars may be overtaken on the near side, but in this case special caution is necessary. Watch carefully to see if passengers are boarding the tramcar or alighting from it before you pass; in any case, go slow.

Mr. Morrison continues: "As regards omnibuses setting down or picking up passengers, I cannot imagine there is any special danger from overtaking traffic, as these vehicles can and should draw up to the kerb on such occasions.

"I am advised that I have the power on the application of councils of counties or county boroughs or of urban districts having a population of over 20,000, according to the last census for the time being, to make an order under section 46 (2) (*d*) of the Road Traffic Act, 1930, dealing with the control of motor cars at tramway stopping places, but I do not propose to exercise my powers in this respect as I consider that the matter is more suitably dealt with in the Highway Code.

"I would point out that if any driver actually endangers a person boarding or alighting from a tramcar, he would be liable to proceedings for dangerous driving, while if he did not actually endanger anyone but did not show consideration, he could be proceeded against for careless driving."

In a comment on this reply, Mr. Knight said: "The code will be a worthy monument of Mr. Morrison's good intentions, but the safety of the roads may involve the additional safeguards the statute provides. I take the Minister's letter to mean he would consider suggestions for strengthening the Code. In any event local authorities will have in reserve the right to apply for a further order to ensure public safety."

## BELFAST TRAMWAYS MANAGERSHIP.

Speaking at a meeting of Belfast Corporation on December 17, Councillor J. D. M'Clure, chairman of the Tramways Committee, said they did not anticipate getting applications for the post of tramways manager from any of the top class men, who would have to sacrifice their pension rights. It was hoped, however, to get an excellent man who had still a good deal of his reputation to make. He defended the proposal that applicants should state the salary required, as they had done so on a previous occasion when they secured an excellent man in Mr. Johnstone Wright, who had made his reputation in Belfast. Alderman Nixon moved the reference back on the ground that the matter of salary should first be considered by the General Purposes Committee, but this was lost. Alderman Alexander moved a further amendment to make it clear whether candidates' qualifications must include both mechanical and electrical engineering or not, and to state a minimum salary. He felt it was most necessary that the successful applicant should have some knowledge of motor engineering as well as of electrical engineering. Councillor McMahon saw no reason why they should not split the positions. This amendment was also defeated, and the minutes were passed.

An advertisement inviting applications for appointment to the position appears elsewhere in this issue.

## SOUTHERN RAILWAY'S ROAD POLICY.

At Bournemouth Council meeting a letter was received from the Southern Railway, stating that, instead of operating passenger road services in competition with the existing road operators, the company had decided where possible to acquire substantial interests in the principal companies, and to enter into working agreements for the purpose of co-ordinating rail and road passenger traffic. The company, therefore, asked that licences be granted to the Devon General Omnibus and Touring Co. for a Bournemouth-Exeter-Torquay service, and to Greyhound Motors for a Bournemouth-London service. Letters were also received from the companies named, applying for licences. The Council replied that they would be willing for the twelve licences already agreed to be issued to the Southern Railway to be allocated to the two companies, such licences to be subject to the usual conditions.

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## THE ROAD TRAFFIC ACT.

PROVISIONS COMING INTO FORCE ON JANUARY 1.

On Thursday next, January 1, the speed limit for the drivers of light cars and motor cycles disappears, but those who drive recklessly or dangerously after that date will be liable to heavier penalties. All other motor vehicles—cars seated for more than seven passengers, omnibuses, coaches, light vans, goods carriers, lorries, tractors and vehicles of any kind with trailers—will be subject to speed limits which the authorities intend to enforce.

The speed limits applicable to various classes of motor vehicles are as follows :—

PASSENGER VEHICLES—light cars and cycles, no limit ; heavy cars seated for more than seven passengers (motor coaches), thirty miles per hour ; invalid carriages, cars not fitted with pneumatic tyres, and cars drawing trailers, twenty miles per hour.

GOODS VEHICLES—cars with pneumatic tyres, and heavy cars similarly equipped and constructed for the conveyance of horses and their attendants, thirty miles per hour ; cars with soft or elastic tyres and heavy cars with pneumatic tyres, twenty miles per hour ; heavy cars with soft or elastic tyres, sixteen miles per hour. Lower speeds varying from sixteen to five miles per hour are provided for all goods vehicles drawing trailers. The maximum speed for a motor tractor is sixteen when not drawing a trailer and eight miles per hour when so employed, provided that soft or elastic tyres are used. In other cases the maximum speed is five miles per hour.

The penalty for exceeding the speed limit is, on a first offence, a fine not exceeding £20, and on a second offence a fine of £50 or three months' imprisonment. A driver cannot be convicted of a speeding offence on the evidence of one witness alone. An employer or other person who aids or abets a speeding offence is liable on a first conviction to a fine of £50, and on a second conviction to a fine of £100 or three months' imprisonment, or both.

The publication of a time-table or schedule giving directions inconsistent with the observance of the speed limit will be regarded as evidence of an incitement to the driver to commit an offence against the speed laws.

On New Year's Day it will become unlawful for any person to use or permit any other person to use a motor vehicle on the road unless a policy of insurance against third-party risks is in force. The penalty for failure to insure is a fine of £50 or three months' imprisonment, or both, and the offender must be disqualified from holding a licence for twelve months unless the Court thinks fit for special reasons to order otherwise. Drivers must carry their certificates of insurance, and produce them on demand of a police-constable. From January 1 certificates must also be produced when applying for motor vehicle licences.

Other provisions of the Road Traffic Act which come into force next Thursday concern the licensing and regulation of public service vehicles, and applications by Local Authorities to the Traffic Commissioners for consent to run public service vehicles on new routes outside their areas.

## MOTOR-COACH RESTRICTIONS IN LONDON.

TRANSPORT MINISTER'S PROPOSALS.

In order to relieve congestion in central London, the Minister of Transport, on the advice of the London and Home Counties Traffic Advisory Committee, proposes to make regulations under the London Traffic Act, 1924, to come into force not sooner than February 1, which will have the general effect of restricting the operation of certain classes of public service vehicles within the central London area.

The regulations will apply to all public service vehicles as defined in the Road Traffic Act, 1930, other than contract carriages or stage carriages plying for hire by short stages. In other words, they will apply to vehicles commonly known as motor coaches or chars-a-bancs (as distinct from the short-stage omnibus), except in cases where the vehicle has been hired as a whole and is used on a special occasion for the conveyance of a private party.

The draft regulations prohibit these vehicles from entering on weekdays the area enclosed within the following streets, but excluding those streets :—

| | |
|---|---|
| High Holborn from Kingsway. | Victoria-street. |
| New Oxford-street. | Broad Sanctuary. |
| Oxford-street. | Parliament-square. |
| New Bond-street. | Bridge-street. |
| Old Bond-street. | Victoria Embankment. |
| Piccadilly from Old Bond-street to Hyde Park-corner. | Approach-road. |
| | Norfolk-street. |
| Grosvenor-place. | Aldwych East. |
| Grosvenor-gardens. | Kingsway. |

In addition, these vehicles will be prohibited from entering between the hours of 3 a.m. and 7 p.m. on any weekday except Saturday, or between 3 a.m. and 3 p.m. on Saturday, the larger area enclosed within the streets named below, but excluding those streets :—

| | | |
|---|---|---|
| Euston-road. | Belgrave-road. | Tower Bridge-road. |
| Marylebone-road. | Gillingham-street. | Tower Bridge. |
| Edgware-road. | Vauxhall Bridge-road. | Tower Bridge-approach. |
| Marble Arch. | Vauxhall Bridge. | Mansell-street. |
| Park-lane. | Albert Embankment. | Royal Mint-street. |
| Hamilton-place. | Lambeth-road. | Leman-street. |
| Piccadilly. | St. George's-circus. | Commercial-street. |
| Hyde Park-corner. | Borough-road. | Great Eastern-street. |
| Grosvenor-place. | Borough High-street. | Old-street. |
| Grosvenor-gardens. | Trinity-street. | City-road. |
| Buckingham Palace-road. | Great Dover-street. | Pentonville-road. |
| Eccleston-bridge. | Old Kent-road. | |

The regulations will also provide for the vehicles affected to have access by prescribed routes to certain existing motor-coach stations and omnibus garages situated close to the fringe of the larger area.

As regards the boundary of this area, the Minister wishes it to be understood that it may be necessary, at some future date, to apply the prohibition to a larger area.

Copies of the draft regulations, price 1d., can be obtained from the Ministry of Transport by individual motor coach proprietors and representative associations and bodies affected, and any representations in regard to the regulations must be made in writing to the Secretary, Ministry of Transport, 7, Whitehall Gardens, London, S.W.1, not later than January 28, 1931.

## PROTEST AGAINST COACH RESTRICTIONS.

A letter protesting against the proposed restrictions on motor coaches in central London has been addressed to the Ministry of Transport by the chairman of the Executive Committee of the Motor Hirers' Association (Mr. E. Monkman). The letter states :—

"We protest in principle against a particular form of vehicle being singled out for the purpose of relieving congestion. We deny that motor coaches with their speed of travel and their great acceleration, added to the fact that they make few, if any, intermediate stops after departure, cause nearly as much congestion as horse-drawn vehicles ; loading and unloading of commercial vehicles at kerb ; private cars left at kerbside while owners are paying business calls or shopping—in this connection a "prohibition" regulation in effect affords advantages and liberty to the wealthier class who own private motor cars ; motor omnibuses setting down and picking up — on this point, why should express carriage passengers be singled out as against stage carriage passengers ; motor omnibuses running "peak" services at "valley" hours, greatly in excess of travel requirements.

"We submit most strongly that a motor coach which picks up 32 passengers with luggage causes infinitely less congestion than the stage carriages required to carry those passengers and their luggage to a point on the periphery of the banned zone, apart from which, accommodation in stage carriages is required by business people at the main times of departure of large numbers of motor coaches. If it be suggested that taxicabs could be used, we point out that at least eight such vehicles would be required to accommodate a similar load, even if available. Many parts of London included in coach operations are not covered by tube railway services ; this point, of course, refers to the question of "through London" coach services. We submit most strongly the undue hardship, amounting in some cases to definite cessation of business, with its consequent effect on employment, which the restricted area would inflict on many operators. Businesses have been built up entirely dependent on the use of expensive booking offices in main thoroughfares, and it is the experience of the trade that the tendency of travellers is to book at or near the starting points. Many of these offices are held on long leases.

"We further draw attention to the great inconvenience to the travelling public in south-west London wishing to travel north-east, and passengers in north and north-west London wishing to travel to resorts on the south-east coast. The effect of the regulations would make it impossible for operators to comply with Clause 19 of the Road Traffic Act, 1930 (relating to hours of employment). Finally, we would refer to the invitation extended to this association by the chairman of the London and Home Counties Traffic Advisory Committee to attend a conference of the sub-committee set up to enquire into this matter. Three representatives duly attended and submitted information on behalf of our members. It is apparent, in our opinion, that in framing the draft regulations the evidence submitted on behalf of motor coach owners has been totally disregarded, and it is therefore desired to make clear that motor coach operators are a law-abiding, peace-loving section of the industry, but that their love of peace and, if it may be dared to add, their observance of the law will be only in measure to the fair treatment that is meted out to them."

## LONDON HOLIDAY TRANSPORT.

On the London Underground Railways normal services were operated on Christmas and Boxing Days, with additional services for sporting events at places served by the railways. Cheap day tickets were available on Boxing Day. The L.G.O.C. withdrew the omnibus services at 4 p.m. on Christmas Day, but maintained a skeleton service to various points. The M.E.T., L.U.T., and S.M.E. Tramways also ceased operating at 4 p.m. on Thursday, but on Friday additional services were available until a late hour.

Fifty per cent. more cars were placed in service between 10 a.m. and 4 p.m., and also in the late evening on Monday, Tuesday, and Wednesday last by the London County Council Tramways Department. In the three days, the total mileage run was 775,000. On Christmas Day the services were as on Sundays, but augmented by earlier cars on most routes. Although all services were withdrawn at 4 p.m., the all-night cars became available on nine routes not long after midnight.

**The Congestion at the "Elephant."**—Arising out of a statement before the House of Commons Committee on the L.C.C. Bill for improvements at the "Elephant," that there were delays of 13 minutes to traffic endeavouring to pass through this congested area, Sir Percy Simmons, chairman of the Improvements Committee, has informed the County Council that a time check was taken on all tramcars on two days last July for fourteen hours each day. Forty-two tramcars out of 9,465 occupied ten minutes or over to traverse the junction, the maximum being fourteen minutes. The average time for all cars was 2½ minutes.

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## MISCELLANEOUS NEWS AND NOTES.

**Another Wigan Route to be Changed Over.**—Wigan Corporation has come to an agreement with the Ince District Council to substitute omnibuses for tramcars on the Ince and Hindley routes.

**Loop Line to be Laid at Sunderland.**—The Sunderland Town Council has agreed to the Tramways Committee's proposal to apply for an order to lay a loop line from Gladstone-street to Roker Baths-road.

**Safety in Tramcars.**—An advertisement displayed in the Manchester Corporation tramcars states that during the thirty years' operation of tramcars in the city, only one passenger has been killed in a tramcar.

**Cork Tramways Abandonment.**—The Cork Tramway Co. have decided to abandon the tramway service, and it is believed that a service of omnibuses will be substituted by the Irish Omnibus Co., which already has vehicles running in the Cork streets.

**Omnibuses Replace Trains.**—The branch line of the London, Midland and Scottish Railway between Airdrie and Newhouse has been closed to passenger traffic and a service of Midland omnibuses substituted. It is understood that further stations will be closed in the New Year and omnibus services inaugurated.

**Glasgow's New Garage.**—The Minister of Transport will open the extension of the Larkfield garage of Glasgow Transport Committee on January 19. The building will now accommodate 200 double-deck omnibuses, and it is stated to be the largest garage in the country.

**Dewsbury to Oppose Substitution Bill.**—Dewsbury Town Council have decided to oppose the Bill to be promoted by the Yorkshire (Woollen District) Electric Tramways, Ltd., seeking powers to abandon the tramways in the Heavy Woollen District and to substitute omnibuses.

**Improved L.C.C. Tramcars.**—Of the fleet of 1,750 tramcars in the London County Council service, 1,400 have now been reconditioned and equipped with transverse upholstered seats in the lower saloons and upholstered seats in the upper saloons, and the lighting greatly improved. Experiments are being continued to provide cars of even greater comfort and operating efficiency.

**Future of Paris Tramways.**—M. Fernand Laurent, a Paris municipal councillor, has proposed to the Municipal Council that when the new contract with the Paris Transport Co. is drawn up in the New Year the tramways should be abandoned in the city area. Owing to the development of the Paris underground system it is now possible to get within a very short distance of any address in the city.

**Availability of Northern Ireland Licences.**—The Minister of Transport having certified that satisfactory provision is made by Northern Ireland for the granting of licences to drive motor vehicles, the holder of a Northern Ireland licence may now legally drive in Great Britain a vehicle of the class or description which he is authorised by that licence to drive, provided he is not disqualified under the Road Traffic Act.

**Edinburgh Manager Against Transfer Tickets.**—Mr. F. A. Fitzpayne, manager of Edinburgh Corporation Transport, has submitted a report to the Transport Sub-Committee in which he expresses the opinion that transfer tickets should not be introduced, and that the best policy is to continue to extend the distances of the 1d. and 2d. stages. At present these are 1 mile 587 yards and 2 miles 1,607 yards, respectively.

**Halifax Track Renewal.**—The Halifax Tramways Committee has decided to recommend the Town Council to renew the track on certain routes at a cost of £96,000. Where renewal is not proposed, the tramways should only continue on those sections during the life of the present track. To renew all the track that requires renewing would cost £200,000. The substitution of motor omnibuses may be considered as certain tracks wear out.

**Blackburn Seeking Trolleybus Powers.**—In the Parliamentary Bill being promoted by Blackburn Corporation a clause will provide for the running of trolleybuses. Alderman George Burke, chairman of the Tramways Committee, states that, as yet, they are not convinced that trolleybuses are of advantage to Blackburn, but powers are sought so that they may take advantage of them at some future time without having to promote another Bill.

**Pupils' Tickets on the L.C.C. Tramways.**—Fourpenny tickets available for unlimited travel between 7.30 a.m. and 5.30 p.m. on Mondays to Fridays inclusive when either elementary or secondary schools are in session are to be issued on the L.C.C. Tramways to school children. In the case of children between the ages of 14 and 16 years, proof of attendance at school will be required. The 6d. daily tickets for children under 14 years are to be discontinued.

**Road Transport and the Railways.**—Mr. Morrison, Minister of Transport, stated in the House of Commons recently that he believed that the proportion of passenger road transport undertakings in the country actually controlled by railway companies was small. At the same time he understood that the railway companies had acquired a financial interest in a large number of such undertakings. No grants had been made by the Government for the development of road transport companies.

**Rawtenstall Manager's Resignation.**—At a meeting of Rawtenstall Town Council on December 19, it was decided to ask Mr. C. L. E. Stewart, electrical engineer and tramways manager, to resign. It was stated that Mr. Stewart had, contrary to the conditions of his appointment, engaged in private practice. Mr. Stewart's resignation was handed to the Town Clerk the same day. He has held the position since 1909, and his salary is £1,170 a year. As reported last week the Council had decided to separate the posts of electrical engineer and tramways manager.

**Glasgow and the New Licensing System.**—Glasgow will benefit by the new system of licensing public service vehicles under the Road Traffic Act. According to a Corporation authority, their recent Act of Parliament gave them a monopoly in public transport, subject to certain reasonable conditions, and it cannot be disturbed by the Traffic Commissioners. As it will not be necessary under the Road Traffic Act to get the consent of local authorities to run omnibuses in their areas, the Corporation can run their omnibuses beyond the boundaries of the city, providing, of course, they get the sanction of the Traffic Commissioners.

**Procedure of the Area Commissioners.**—After considering complaints of omnibus owners ignoring timetable arrangements with licensing authorities, of withdrawing certain "runs," and of indifferent time-keeping, the North-East Coast Regional Advisory Committee have recommended the constituent authorities to take checks in their districts and to inform owners that the licensing authorities must be communicated with before alterations are made. The clerk expressed his opinion that a more concentrated effort should be launched with regard to the schedules. It would appear, he said, that each authority's case for the retention or elimination of services depended upon the thoroughness of the preparation of the schedules, should the Commissioners under the Road Traffic Act call for information of this kind.

**Minister of Transport and Drivers' Hours.**—Speaking at Hackney on December 12, the Minister of Transport said he hoped that neither employers nor workpeople would think that Section 19 of the Road Traffic Act, which limits the time in which drivers of road locomotives, tractors, public service vehicles and goods-carrying motor vehicles may remain continuously on duty, could be ignored. He was determined in the interests of public safety that the section should be operative. Prosecutions would be undertaken with all vigour. Provision was made for reasonable relaxation of the section on the joint representation of employers and workmen's organisations, and the best thing that the industry could do was for employers and workpeople to agree as to what was desirable, for the section was to come into operation on February 1.

## CONTRACTS.

**Ilford Tramways Committee** has accepted the tender of the Vulcan Motor & Engineering Co. for the supply of a tower wagon at £570.

**Crosville Motor Services** and the **Western Welsh Omnibus Co.** have placed orders for "Eqwhipple" engine starters with the Equipment and Engineering Co., Ltd.

**Marston Thompson & Evershed, Ltd.,** brewers, Burton-on-Trent, have placed an order for a Luchard high-pressure air compressor for tyre inflation with the Equipment and Engineering Co., Ltd.

**The British Thomson-Houston Co., Ltd.,** of Rugby, has received an important order for two 75,000 kW. turbo-alternators from the County of London Electric Supply Co. for their new Barking station, the consulting engineers for which are Messrs. Merz and McLellan. These turbo-alternators are the largest machines yet ordered in this country.

## FINANCIAL ITEMS.

**United Automobile Services, Ltd.**—At the annual meeting on December 23 the chairman, Mr. Thomas Hornsby, said that in spite of unprecedented trade depression and last summer's unseasonable weather the gross receipts had increased from £858,155 in 1929 to £1,138,287. This year the company's vehicles carried nearly 72,000,000 passengers, an increase of 26 per cent. on last year.

**Municipal Transport Receipts.**—Official returns of forty of the principal municipal tramway and omnibus undertakings in the United Kingdom for the week ended December 5, gave total receipts of £408,560, or £13,343 less than in the corresponding week of last year. The aggregate receipts for thirty-six weeks amounted, with certain adjustments, to £15,166,040, showing an increase of £96,088 over the corresponding period of last year.

**L.C.C. Tramways Receipts.**—The traffic receipts for the week ended December 24 amounted to £91,344, an increase of £6,211 compared with the corresponding week of last year. The route length was 165.60 miles, as compared with 166.29 a year ago. From April 1 (the commencement of the financial year) to December 17, (38 2-7 weeks) the total receipts were £3,177,580, a decrease of £41,924.

**Cardiff's Estimated Profits.**—At a meeting of Cardiff Corporation Tramways and Motors Committee on December 22 an estimate of the profits for the current year was given by Mr. William Forbes, the general manager. This showed an estimated profit of £3,491 on the tramways and £6,946 on the omnibuses. Mr. Forbes was complimented on the improvements and economies he had effected, and on the gradual return of the undertaking to prosperity, and a vote to that effect was carried unanimously.

**National Omnibus Co.**—On December 23 the National Omnibus and Transport Co. repaid to its shareholders capital totalling £550,000 in accordance with a scheme passed in July. During the past six years the company has been remarkably successful. In 1924 the capital was £257,000, no dividends had been paid for several years, and there was an accumulated loss of about £80,000. Now the capital is £800,000, the number of garages has increased from 17 to 70, vehicles from 414 to 1,667, and passengers carried have advanced from 12¼ millions to 57½ millions, while the dividend has changed from nothing to 11¼ per cent.

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## PERSONAL.

**Mr. C. W. F. Cozens,** who for the past 12 months has been acting manager for the Teeside Railless Traction Board, was on December 18 appointed general manager of the undertaking.

**Mr. L. M. Barry,** who has been in the service of the Johannesburg Municipality for 26 years and is at present assistant manager of the tramways department, has been appointed manager at a salary of £1,550 a year, plus travelling allowance of £17 10s. a month. The appointment is subject to his serving the usual probationary period of six months at his present salary.

We regret to record the death of **Mr. George Martin Gamble,** who so recently as October 1 was appointed sales manager of Karrier Motors, Ltd. The death was due to heart failure, and Mr. Gamble had been busily engaged in his office a few hours previously. His loss will be felt by a large circle of friends, whose sympathy will be extended to his widow.

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS.

| Name | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Aberdare U.D.C. ... | Dec. 16 | 611 | 576 | — 35 | 37 | 21,788 | — 252 |
| „ Motor Buses ... | „ 16 | 298 | 316 | + 18 | 37 | 11,263 | + 1,897 |
| „ Total ... ... | „ 16 | 909 | 892 | — 17 | 37 | 33,051 | + 1,645 |
| Aberdeen Corp. ... | „ 24 | 4,670 | 4,767 | + 97 | 29½ | 154,234 | + 2,741 |
| Ashton-u-Lyne Corp. | „ 13 | 934 | 780 | — 154 | 37 | 51,100 | — 2,902 |
| „ Motor Buses ... | „ 13 | 468 | 470 | + 2 | 37 | 18,207 | + 190 |
| „ Trolley Buses ... | „ 13 | 294 | 246 | — 48 | 57 | 19,565 | — 862 |
| „ Total ... ... | „ 13 | 1,696 | 1,496 | — 200 | 57 | 78,872 | — 3,574 |
| Ayr Corporation ... | „ 20 | 466 | 383 | — 83 | 30 | 18,115 | — 1,562 |
| Barrow Corporation... | „ 20 | 542 | 540 | — 2 | 38 | 21,719 | — 1,219 |
| „ Motor Buses ... | „ 20 | 346 | 379 | + 33 | 38 | 15,514 | + 624 |
| „ Total ... ... | „ 20 | 888 | 919 | + 31 | 38 | 37,233 | — 595 |
| Belfast City ... ... | „ 19 | 11,615 | 11,811 | + 196 | 37½ | 432,683 | + 12,057 |
| „ Motor Buses ... | „ 19 | 1,302 | 1,446 | + 144 | 37½ | 49,777 | + 9,126 |
| „ Total ... ... | „ 19 | 12,917 | 13,257 | + 340 | 37½ | 482,460 | + 21,183 |
| Birkenhead Corp. ... | „ 21 | 1,597 | 1,414 | — 183 | 38 | 56,885 | — 6,640 |
| „ Motor Buses ... | „ 21 | 3,371 | 4,021 | + 650 | 38 | 143,608 | — 6,174 |
| „ Total ... ... | „ 21 | 4,968 | 5,435 | + 467 | 38 | 200,493 | — 466 |
| Birmingham Corp. ... | „ 16 | 29,097 | 26,550 | — 2,547 | 37 | 966,033 | — 55,959 |
| „ Motor Buses ... | „ 16 | 14,638 | 17,151 | + 2,513 | 37 | 583,536 | + 87,922 |
| „ Trolley Buses ... | „ 16 | 633 | 564 | — 69 | 37 | 19,913 | — 1,061 |
| „ Total ... ... | „ 16 | 44,368 | 44,265 | — 103 | 37 | 1,569,482 | + 30,902 |
| Blackburn Corp. ... | „ 24 | 2,043 | 1,884 | — 161 | 38¼ | 68,705 | — 6,445 |
| „ Motor Buses ... | „ 24 | 386 | 411 | + 25 | 38¼ | 12,559 | ... |
| „ Total ... ... | „ 24 | 2,429 | 2,295 | — 134 | 38¼ | 81,264 | ... |
| Bradford Corporation | „ 20 | 9,931 | 9,054 | — 877 | ... | ... | ... |
| „ Motor Buses ... | „ 20 | 3,356 | 3,077 | — 279 | ... | ... | ... |
| „ Trolley Buses ... | „ 20 | 1,409 | 1,911 | + 502 | ... | ... | ... |
| „ Miscellaneous ... | „ 20 | 377 | 277 | — 100 | ... | ... | ... |
| „ Total ... ... | „ 20 | 15,073 | 14,319 | — 754 | 57 | 543,366 | — 22,226 |
| Brighton Corporation | „ 21 | 2,266 | 2,215 | — 51 | 36¾ | 103,139 | + 1,294 |
| Burnley Corporation... | „ 20 | 3,093 | 2,598 | — 495 | .. | ... | ... |
| „ Motor Buses ... | „ 20 | 679 | 739 | + 60 | ... | ... | ... |
| „ Total ... | „ 20 | 3,772 | 3,337 | — 435 | | | |
| Bury Corporation ... | „ 21 | 1,889 | 1,557 | — 332 | 37¾ | 65,278 | — 10,891 |
| „ Motor Buses ... | „ 21 | 819 | 1,389 | + 570 | 37¾ | 46,486 | + 25,279 |
| „ Total ... ... | „ 21 | 2,708 | 2,946 | + 238 | 57¾ | 111,764 | + 14,388 |
| Cardiff Corporation ... | „ 13 | 7,943 | 7,483 | — 460 | 36½ | 285,727 | + 1,006 |
| Chester Corporation ... | „ 21 | 429 | Nil | — 429 | 38 | Nil | — 16,584 |
| „ Motor Buses ... | „ 21 | Nil | 685 | + 685 | 38 | 25,363 | + 25,363 |
| „ Total ... ... | „ 21 | 429 | 685 | + 256 | 38 | 25,363 | + 8,779 |
| Chesterfield Corp. ... | „ 22 | 2,124 | 2,105 | — 19 | 38 | 73,802 | + 535 |
| Colchester Corp. ... | „ 17 | 609 | 601 | — 8 | 38 | 22,918 | + 2,082 |
| Colne Corporation ... | „ 17 | 700 | 625 | — 75 | 37 | 25,900 | — 625 |
| Coventry Corporation | „ 21 | 2,309 | 2,072 | — 237 | 38 | 73,771 | — 7,819 |
| „ Motor Buses ... | „ 21 | 1,908 | 2,075 | + 167 | 38 | 68,667 | + 6,433 |
| „ Total ... ... | „ 21 | 4,247 | 4,147 | — 70 | 38 | 142,438 | — 1,386 |
| Darlington Corp ... | „ 20 | 1,094 | 1,096 | + 2 | 37¾ | 40,027 | + 2,591 |
| Derby Corporation ... | „ 20 | 2,579 | 2,204 | — 375 | 38 | 90,853 | — 4,828 |
| „ Motor Buses ... | „ 20 | 871 | 1,218 | + 347 | 38 | 36,064 | + 7,412 |
| „ Total ... ... | „ 20 | 3,450 | 3,422 | — 28 | 38 | 126,917 | + 2,584 |
| Dover Corporation ... | „ 20 | 371 | 375 | + 4 | 28 | 16,329 | + 418 |
| Dundee Corporation... | „ 2 | 2,658 | 2,464 | — 194 | 28¾ | 73,269 | — 2,562 |
| „ Motor Buses ... | „ 2 | 843 | 1,160 | + 317 | 28¾ | 32,890 | + 8,647 |
| „ Total ... ... | „ 2 | 3,501 | 3,624 | + 123 | 28¾ | 106,159 | + 6,085 |
| East Ham Corp. ... | „ 13 | 2,433 | 2,261 | — 172 | 36½ | 83,673 | — 541 |
| Edinburgh Corp. ... | „ 20 | 14,368 | 14,566 | + 198 | 31¼ | 464,593 | + 7,121 |
| „ Motor Buses ... | „ 20 | 3,541 | 3,776 | + 235 | 31¼ | 118,477 | + 8,874 |
| „ Total ... ... | „ 20 | 17,909 | 18,342 | + 433 | 31¼ | 583,070 | + 15,965 |
| Exeter Corporation ... | „ 17 | 834 | 735 | — 99 | 28 | 29,753 | — 3,064 |
| „ Motor Buses ... | „ 17 | 219 | 414 | + 195 | 38 | 13,168 | + 7,042 |
| „ Total ... ... | „ 17 | 1,053 | 1,149 | + 96 | 38 | 42,921 | + 3,978 |
| Glasgow Corporation... | „ 13 | 46,088 | 42,482 | — 2,606 | 28 | 1,211,001 | — 25,852 |
| „ Motor Buses ... | „ 13 | 7,007 | 10,766 | + 3,759 | 28 | 257,376 | + 94,977 |
| „ Total ... ... | „ 13 | 53,095 | 53,248 | + 153 | 28 | 1,468,377 | + 69,125 |
| Gloucester Corp. ... | „ 17 | 678 | 745 | + 67 | 37¾ | 26,958 | + 4,743 |
| Grimsby Corporation | „ 20 | 1,604 | 1,639 | + 35 | 38 | 60,685 | + 5,598 |
| Halifax Corporation | „ 16 | 5,204 | 4,907 | — 297 | 37½ | 191,266 | + 16,927 |
| Huddersfield Corp. ... | „ 13 | 6,426 | 5,963 | — 463 | 37 | 235,032 | — 3,243 |
| Hull Corporation ... | „ 20 | 6,388 | 6,040 | — 348 | 38 | 218,695 | — 10,837 |
| „ Motor Buses ... | „ 20 | 1,556 | 1,916 | + 360 | 38 | 63,020 | + 10,090 |
| „ Total ... ... | „ 20 | 7,944 | 7,956 | + 12 | 38 | 281,715 | — 747 |
| Ilford Corporation ... | „ 20 | 1,04 | 1,665 | + 61 | 37½ | 57,592 | + 756 |
| Ipswich Corp. Trol.Bus. | „ 20 | 1,365 | 1,467 | + 102 | 37½ | 51,506 | + 2,513 |
| Isle of Thanet ... | „ 17 | 379 | 337 | — 42 | 50½ | 40,287 | — 4,689 |
| Kilmarnock Corp. ... | „ 20 | 495 | 532 | + 37 | 31½ | 15,624 | + 617 |
| Lancashire Un. ... | „ 21 | 2,227 | 2,162 | — 65 | 50½ | 108,365 | — 6,466 |
| „ Motor Buses ... | „ 21 | 4,574 | 4,626 | + 52 | 50½ | 250,968 | + 28,572 |
| Leeds Corporation ... | „ 20 | 19,715 | 19,892 | + 177 | 37¾ | 752,684 | — 10,028 |
| Leicester Corp. ... | „ 20 | 8,939 | 8,166 | — 773 | 38 | 317,963 | — 2,175 |
| Lincoln Corp. ... | Nov. 30 | 906 | 858 | — 48 | 35 | 32,752 | + 175 |
| Liverpool Corp. ... | Dec. 17 | 28,538 | 27,243 | — 1,295 | 37¾ | 997,607 | — 21,440 |
| „ Motor Buses ... | „ 17 | 3,378 | 3,535 | + 157 | 37¾ | 123,727 | + 16,233 |
| „ Total ... ... | „ 17 | 31,916 | 30,778 | — 1,138 | 37¾ | 1,121,334 | — 5,207 |
| London County Coun. | „ 24 | 85,133 | 91,344 | + 6,211 | 38¾ | 3,177,580 | — 41,924 |
| Luton Corporation ... | „ 17 | 397 | 386 | — 11 | 37¾ | 15,643 | + 184 |
| Maidstone Corp. ... | „ 18 | 142 | Nil | — 142 | 37¾ | Nil | — 7,522 |
| „ Motor Buses ... | „ 18 | 353 | 268 | — 85 | 37¾ | 10,362 | — 1,500 |
| „ Trolley Buses ... | „ 18 | 303 | 577 | + 274 | 37¾ | 22,712 | + 11,220 |
| „ Total ... ... | „ 18 | 798 | 845 | + 47 | 37¾ | 33,074 | + 2,198 |
| Manchester Corp. ... | „ 20 | 35,597 | 31,952 | — 3,645 | 38 | 1,212,874 | — 117,670 |
| „ Motor Buses ... | „ 20 | 4,774 | 9,596 | + 4,822 | 38 | 335,445 | + 148,034 |
| „ Total ... ... | „ 20 | 40,371 | 41,548 | + 1,177 | 38 | 1,548,319 | + 30,364 |
| Middlesbrough Corp. | „ 16 | 1,139 | 989 | — 150 | 37¾ | 37,816 | — 4,658 |
| „ Motor Buses ... | „ 16 | 563 | 568 | — 5 | 37¾ | 21,015 | + 1,119 |
| „ Total ... ... | „ 16 | 1,702 | 1,557 | — 145 | 37¾ | 58,831 | — 3,519 |

## TRAMWAYS AND OMNIBUS TRAFFIC RETURNS—*Continued.*

| Name | Week ended | Latest Return. 1929 | 1930 | + or — | Aggregate. Wks. | 1930 | + or — |
|---|---|---|---|---|---|---|---|
| | | £ | £ | £ | | £ | £ |
| Newcastle-on-Tv.Corp. | Dec. 20 | 9,793 | 8,815 | — 978 | 37¾ | 324,352 | — 53,768 |
| „ Motor Buses ... | „ 20 | 1,965 | 3,952 | + 1,987 | 37¾ | 124,957 | + 48,383 |
| „ Total ... ... | „ 20 | 11,758 | 12,767 | + 1,009 | 37¾ | 449,309 | — 5,385 |
| Newport Corporation | „ 6 | 1,729 | 1,037 | — 692 | 36 | 49,713 | — 10,488 |
| „ Motor Buses ... | „ 6 | 764 | 1,234 | + 470 | 36 | 36,972 | + 9,696 |
| „ Total ... ... | „ 6 | 2,493 | 2,271 | — 222 | 36 | 86,685 | — 792 |
| Northampton Corp. ... | „ 19 | 1,227 | 769 | — 458 | 37¾ | 35,932 | — 6,220 |
| „ Motor Buses ... | „ 19 | 719 | 1,203 | + 484 | 37¾ | 32,961 | + 7,582 |
| „ Total ... ... | „ 19 | 1,946 | 1,972 | + 26 | 37¾ | 68,893 | + 1,362 |
| Nottingham Corp. ... | „ 18 | 6,534 | 5,504 | — 1,030 | 37¾ | 215,288 | — 32,918 |
| „ Motor Buses ... | „ 18 | 2,915 | 3,549 | + 634 | 37¾ | 128,736 | + 36,609 |
| „ Trolley Buses ... | „ 18 | 639 | 1,160 | + 521 | 37¾ | 44,987 | + 22,448 |
| „ Total ... ... | „ 18 | 10,088 | 10,213 | + 125 | 57¾ | 389,011 | + 26,132 |
| Oldham Corporation | „ 20 | 3,667 | 3,344 | — 323 | 39 | 130,134 | — 9,330 |
| „ Motor Buses ... | „ 20 | 1,986 | 1,839 | — 147 | 39 | 76,065 | — 2,137 |
| „ Total ... ... | „ 20 | 5,653 | 5,183 | — 470 | 39 | 206,199 | — 11,467 |
| Plymouth Corp ... | „ 20 | 3,935 | 3,420 | — 515 | 37¾ | 135,673 | — 8,526 |
| „ Motor Buses ... | „ 20 | 2,380 | 3,042 | + 662 | 37¾ | 96,876 | + 21,097 |
| „ Total ... ... | „ 20 | 6,315 | 6,462 | + 147 | 37¾ | 232,549 | + 12,571 |
| Portsmouth Corp. ... | „ 13 | 3,954 | 3,573 | — 581 | 37 | 155,051 | — 14,948 |
| „ Motor Buses ... | „ 13 | 1,840 | 2,919 | + 1,079 | 37 | 123,112 | + 47,332 |
| „ Total ... ... | „ 13 | 5,794 | 6,292 | + 498 | 37 | 278,163 | + 32,384 |
| Preston Corporation... | „ 17 | 1,680 | 1,614 | — 66 | 37¾ | 62,099 | — 2,931 |
| „ Motor Buses ... | „ 17 | 515 | 514 | — 1 | 37¾ | 19,345 | + 662 |
| „ Total ... ... | „ 17 | 2,195 | 2,128 | — 67 | 37¾ | 81,444 | — 2,269 |
| Rawtenstall Corp. ... | „ 21 | 873 | 637 | — 236 | 37¾ | 24,493 | — 7,867 |
| „ Motor Buses ... | „ 21 | 531 | 687 | + 156 | 37¾ | 26,359 | + 6,564 |
| „ Total ... ... | „ 21 | 1,404 | 1,324 | — 80 | 57¾ | 50,822 | — 1,243 |
| Reading Corporation | „ 18 | 1,670 | 1,544 | — 126 | 38 | 54,403 | — 3,222 |
| „ Motor Buses ... | „ 18 | 995 | 1,136 | + 141 | 38 | 38,554 | + 3,804 |
| „ Total ... ... | „ 18 | 2,665 | 2,680 | + 15 | 38 | 92,957 | + 582 |
| Rochdale Corp. ... | „ 20 | 2,740 | 2,200 | — 540 | ... | 99,383 | — 10,736 |
| „ Motor Buses ... | „ 20 | 1,598 | 2,169 | + 571 | ... | 64,473 | + 5,568 |
| „ Total ... ... | „ 20 | 4,338 | 4,369 | + 31 | | 163,856 | — 5,168 |
| Rotherham Corp. ... | „ 15 | 2,766 | 2,670 | — 96 | 37 | 102,813 | + 2,009 |
| Salford Corporation ... | „ 21 | 11,592 | 11,121 | — 471 | 37¾ | 422,304 | — 3,925 |
| Sheffield Corp. ... | „ 20 | 21,846 | 20,476 | — 1,370 | 37¾ | 770,006 | — 30,147 |
| Southampton Corp. ... | „ 17 | 3,577 | 3,578 | + 1 | 38 | 131,251 | + 1,905 |
| „ Motor Buses ... | „ 17 | 920 | 925 | + 5 | 38 | 33,129 | + 2,726 |
| „ Total ... ... | „ 17 | 4,497 | 4,503 | + 6 | 38 | 164,270 | + 4,631 |
| Southend-on-Sea Corp. | „ 17 | 1,910 | 1,802 | — 108 | 37¾ | 82,188 | — 3,970 |
| „ Trolley Buses ... | „ 17 | 204 | 246 | + 42 | 37¾ | 11,713 | + 3,420 |
| „ Total ... ... | „ 17 | 2,114 | 2,048 | — 66 | 37¾ | 93,901 | — 550 |
| Southport Corp. ... | „ 13 | 1,204 | 1,135 | — 69 | 36½ | 49,618 | — 799 |
| „ Motor Buses ... | „ 13 | 321 | 326 | + 5 | 36½ | 15,699 | + 1,341 |
| „ Total ... ... | „ 13 | 1,525 | 1,461 | — 64 | 36½ | 65,317 | + 542 |
| St. Helens Corp. ... | „ 16 | 2,045 | 2,120 | + 75 | 37¾ | 76,567 | + 3,648 |
| Sunderland Corp. ... | „ 23 | 2,693 | 2,275 | — 418 | 38 | 91,203 | — 2,724 |
| „ Motor Buses ... | „ 23 | 321 | 758 | + 437 | 38 | 24,068 | + 15,054 |
| „ Total ... ... | „ 23 | 3,014 | 3,033 | + 19 | 38 | 115,274 | + 12,330 |
| Swindon Corp. ... | „ 17 | 909 | 1,002 | + 93 | 37¾ | 36,974 | + 6,519 |
| Wallasey Corp. ... | „ 20 | 1,180 | 1,122 | — 58 | 37¾ | 46,485 | — 3,815 |
| „ Motor Buses ... | „ 20 | 1,947 | 1,971 | + 24 | 37¾ | 87,792 | + 7,684 |
| „ Total ... ... | „ 20 | 3,127 | 3,093 | — 34 | 37¾ | 134,257 | + 3,869 |
| Walsall Corporation... | „ 14 | 3,647 | 3,883 | + 236 | 37 | 131,554 | + 4,302 |
| Walthamstow Corp. ... | „ 20 | 2,516 | 2,531 | + 15 | 37¾ | 93,128 | — 782 |
| Warrington Corp. ... | „ 21 | 940 | 923 | — 17 | 38 | 33,921 | + 61 |
| „ Motor Buses ... | „ 21 | 479 | 525 | + 46 | 38 | 19,253 | + 1,968 |
| „ Total ... ... | „ 21 | 1,419 | 1,448 | + 29 | 38 | 53,174 | + 2,029 |
| West Ham Corp. ... | „ 18 | 6,787 | 6,470 | — 317 | 37¾ | 226,158 | — 3,435 |
| Wolverhampton Corp. | | | | | | | |
| „ Motor Buses ... | „ 21 | 3,026 | 2,400 | — 626 | 38 | 91,542 | — 15,183 |
| „ Trolley Buses ... | „ 21 | 3,629 | 4,005 | + 376 | 38 | 133,803 | + 5,790 |
| „ Total ... ... | „ 21 | 6,655 | 6,405 | — 250 | 38 | 225,345 | — 9,393 |
| York Corporation ... | „ 17 | 1,025 | 957 | — 68 | 38 | 58,692 | — 1,278 |
| „ Motor Buses ... | „ 17 | 462 | 584 | + 122 | 38 | 19,842 | + 4,437 |
| „ Trolley Buses ... | „ 17 | 70 | Nil | — 70 | 38 | Nil | — 2,100 |
| „ Total ... ... | „ 17 | 1,557 | 1,541 | — 16 | 38 | 58,534 | + 1,004 |

## FOREIGN AND COLONIAL TRAMWAY TRAFFIC RETURNS.

| Name. | Week or M'th. | Latest Return. 1929 | 1930 | Wks. or *M* | Aggregate. 1930 | In. or Dec. |
|---|---|---|---|---|---|---|
| Anglo-Argentine | Dec. 16 | £88,839 | £79,952 | 50 *w* | £4,081,400 | — £249,928 |
| Brazilian Traction $ | Nov. | 4,145,850 | 3,532,353 | 11 *m* | 43,313,377 | —2,053,527 |
| British Columbia $ | Oct. | 1,230,278 | 1,248,830 | 4 *m* | 4,846,038 | + 121,008 |
| Buenos Aires Lacroze | Dec. 21 | 12,322 | 11,698 | 25 *w* | 281,237 | — 15,811 |
| Burma E. Sup. Co. Rs. | Nov. | 59,295 | 61,401 | 4 *m* | 258,599 | + 21,482 |
| Calcutta ... Rs. | Dec. 20 | 124,216 | 103,281 | 50½ *w* | 5,529,767 | — 879,086 |
| Cape Town ... ... | Nov. | ... | 24,750 | ... | ... | ... |
| Carthagena & Herrerias | Nov. | 1,350 | 553 | 11 *m* | 8,404 | — 3,649 |
| Durban Corporation | Nov | 23,214 | 21,219 | 4 *m* | 90,139 | — 5,385 |
| East India ... ... | Nov. | 3,905 | 3,507 | 4 *m* | 14,995 | — 1,266 |
| Kalgoorlie ... ... | Sept. | 1,980 | 2,061 | 9 *m* | 15,833 | + 228 |
| Madras (2 weeks) Rs. | Dec. 15 | 43,326 | 45,347 | 48 *w* | 1,054,543 | + 50,083 |
| Para ... ... | Nov. | 15,542 | 11,735 | 12 *m* | 167,345 | — 14,610 |
| Port Elizabeth ... | Nov. | ... | 7,031 | ... | ... | ... |
| Rangoon ... Rs. | Nov. | 137,703 | 154,965 | 11 *m* | 1,658,280 | + 309,994 |
| Shanghai ... $ | Nov. | 360,247 | 433,394 | 11 *m* | 3,974,052 | + 246,145 |
| Singapore ... ...$ | Nov. | 126,000 | 134,000 | 2 *m* | 276,000 | + 17,000 |
| Winnipeg ... ...$ | Oct. | 545,308 | 523,660 | 10 *m* | 5,174,893 | — 216,591 |

## RAILWAY RECEIPTS.

| 51st Week ended Dec. 21st | Passenger £ | Inc. or Dec. | Goods | Inc. or Dec. | Total for Week. | Inc. or Dec. on Week. | Inc. or Dec. to Date. |
|---|---|---|---|---|---|---|---|
| G.W.R. | 229,000 | — 28,000 | 327,000 | — 32,000 | 555,000 | — 60,000 | -1,459,000 |
| L.M.S.R. | 504,000 | — 63,000 | 821,000 | — 91,000 | 1,325,000 | —154,000 | -4,985,000 |
| L.N.E.R. | 331,000 | — 40,000 | 672,000 | — 32,000 | 1,003,000 | — 72,000 | -3,217,000 |
| S.R. | 315,000 | — 31,000 | 112,000 | — 4,000 | 427,000 | — 35,000 | — 628,000 |
| Totals | 1,379,000 | — 162,000 | 1,932,000 | — 159,000 | 3,311,000 | — 321,000 | -10,289,000 |

## ELECTRIC RAILWAYS.

| Name. | Week Ended. | Latest Return. 1929. | 1930. | + or — | Aggregate. 1930. | + or — |
|---|---|---|---|---|---|---|
| London Underground | | | | | | |
| Common Fund Cos. | Dec. 20 | 315,200 | 316,900 | + 1,700 | 15,397,000 | + 752,300 |
| Lond. & Sub. Group | „ 20 | 46,300 | 47,000 | + 700 | 2,263,000 | + 114,500 |
| Metropolitan Railway | „ 20 | 39,200 | 38,500 | — 700 | 1,860,200 | + 5,200 |
| Liverpool Overhead | „ 21 | 1,809 | 1,356 | — 453 | 78,321 | — 7,790 |
| Mersey Railway ... | „ 20 | 5,289 | 5,178 | — 111 | 231,710 | + 3,135 |

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THE TRAMWAY AND RAILWAY WORLD
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# The Tramway & Railway World

WITH OMNIBUS AND COACH SECTION - MONTHLY

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Vol. LXVIII. LONDON, SATURDAY, DECEMBER 20, 1930. No. 31.

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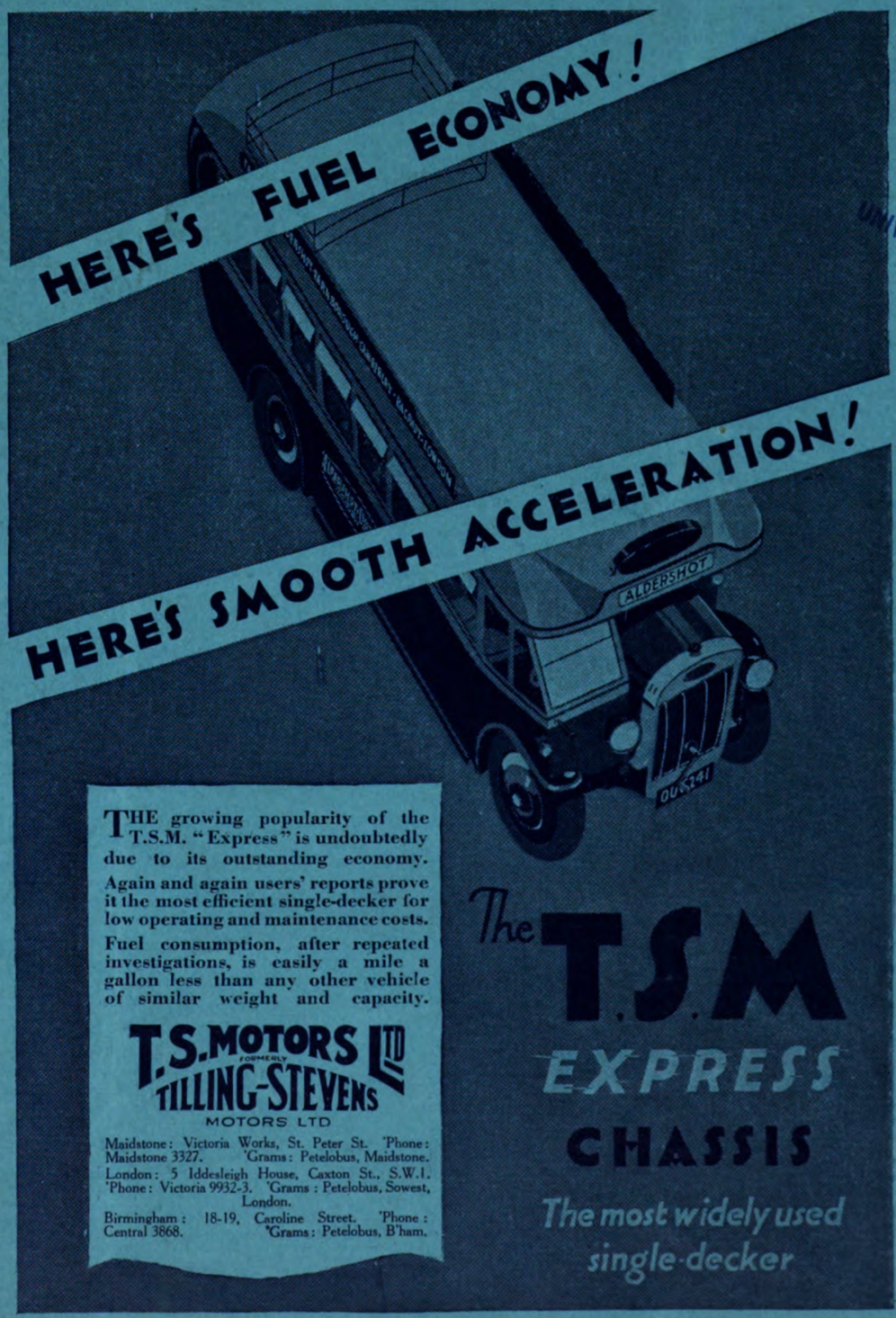


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## NOTICE.

**The Editorial and Publishing Offices of "The Tramway and Railway World" are at Amberley House, Norfolk Street, London, W.C.2.**

**All Communications and Advertisements for next week's issue should be received not later than noon on Saturday.**

**Advertisements for the next issue of which proof is desired should reach us by the second post on Wednesday.**

**Telegrams: "TRAMIGRO, ESTRAND, LONDON."**
**Telephone: TEMPLE BAR 2948.**

## TENDERS INVITED.

### COUNTY BOROUGH OF BURNLEY.

**Tramways and Omnibuses Department.**

**General Stores.**

The Corporation invite tenders for the supply of General Stores for one year ending March 31, 1932, as follows:—

Bolts, Nuts, Studs, Set Screws, Rivets, Washers, etc.
Brass, Gunmetal, etc. Castings.
Brushes, Washleathers, Sponges, etc.
Cast Iron.
Cast Iron Brake Blocks.
Chemicals, etc.
Ironmongery.
Mutton Cloths.
Oils, Colours, Varnishes, etc.
Oil, Grease, etc.

Full particulars and schedules may be had on application to the General Manager, Queensgate, Burnley.

Tenders addressed to the "Chairman of the Tramways & Omnibuses Committee, Tramway Offices, Queensgate, Burnley," and endorsed "General Stores," must be delivered not later than Thursday, January 29, 1931.

COLIN CAMPBELL,
Town Clerk.

Town Hall, Burnley.
December 11, 1930.

### YORK CORPORATION TRANSPORT DEPARTMENT.

**Double-Deck Motor Omnibuses.**

The York Corporation invites Tenders for the supply and delivery of three 6-cylinder, 4-wheel, low-loading Motor Omnibus Chassis, and 48/50-seater double-deck bodies, with covered top saloon and enclosed staircase.

Specifications may be obtained at the Transport Offices, Fulford Road, York.

Parties tendering may submit quotations for complete vehicles, or alternatively, for chassis and double-deck bodies separately.

Quotations, including plans and specification, to be forwarded to the Transport Manager, Transport Offices, Fulford Road, York, in sealed envelopes marked "Tender for Omnibuses," and must be received not later than the first post on Tuesday, December 23, 1930.

The Corporation does not bind itself to accept the lowest or any tender.

R. S. ASHER,
Transport Manager.

Transport Department,
Fulford Road, York.
December 9, 1930.

### CITY OF LEICESTER TRAMWAYS AND MOTOR OMNIBUS DEPARTMENT.

**Motor Omnibuses.**

The Corporation of Leicester invite tenders for the supply and delivery of:—

Four, or alternatively five, Double Deck, Canopy-covered Omnibus Bodies; and
Four, or alternatively five, Six-cylinder Four-wheeler Omnibus Chassis.

Specifications may be obtained on application to the undersigned.

Sealed tenders, endorsed "Motor Omnibuses," to be forwarded to "The Chairman, Tramways and Motor Omnibus Department," Humberstone Gate, Leicester, to be delivered not later than first post Monday, December 22, 1930.

The Corporation do not bind themselves to accept the lowest or any tender.

H. POOL,
General Manager.

### PLYMOUTH CORPORATION.

The Plymouth Corporation is prepared to receive tenders for:—
One 15,000-kw. Turbo Alternator with condenser auxiliaries, etc.

Specification and form of tender may be obtained from the City Electrical Engineer, Armada Street, Plymouth, before December 31, 1930.

Sealed endorsed tenders to be delivered to the undersigned not later than Saturday, January 10, 1931.

The Corporation does not bind itself to accept the lowest or any offer.

R. J. FITTALL,
Town Clerk.

Municipal Buildings, Plymouth.
December 15, 1930.

### COUNTY BOROUGH OF DERBY.

**Trolley Omnibuses.**

The Tramways and Transport Committee are prepared to receive Tenders from experienced manufacturers for Double-deck Trolley Omnibus Chassis and Bodies.

Full particulars may be obtained on application to:

THE GENERAL MANAGER,
Corporation Tramways and Omnibus Department,
4, Victoria Street, Derby.

December 16, 1930.

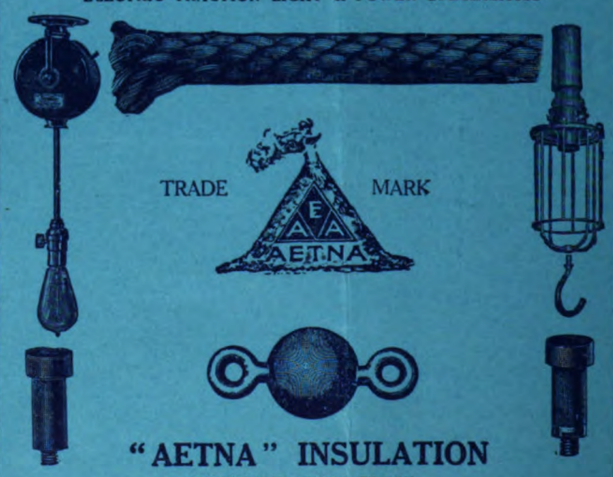
## FOR SALE.

One Electric Arc Welding Plant, Type E.H. No. 1, and one Standard "Celerity" Rail Grinding Machine. Second-hand machines in good condition. Can be inspected at this Depot. Submit offers to GENERAL MANAGER, Corporation Transport Department, Colchester.

December 17, 1930.

**MUNICIPAL OMNIBUS RECORDS.**

Particulars of the operation of over 80 Municipal Omnibus Systems are given in THE TRAMWAY AND RAILWAY WORLD of December 18, including capital outlay, operating expenses—total and per mile—also average daily mileage, passengers carried, fares, etc., etc.

TRADE
ANDERSON
MARK
ELECTRIC TRACTION LIGHT & POWER SPECIALITIES


"AETNA" INSULATION
DELIVERIES FROM STOCK
Albert & J. M. Anderson Mfg. Co.
(FOUNDED 1877)
12 Moor Lane, London, E.C.2
Telegrams: "Aetnaco Barb. London."
Telephone: Metropolitan 2882

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# Telegraphic Addresses and Telephone Numbers of

**Advertisers whose Announcements appear in the Illustrated Issues of "The Tramway and Railway World."**

| Name of Company or Firm | Address | Telegraphic Address | Telephone No |
|---|---|---|---|
| Albion Motor Car Co., Ltd. | Scotstoun, Glasgow | Automobile, Glasgow | Glasgow, Western, 3650 |
| Allen & Co., Ltd., Edgar (Tramway Dept.) | Imperial Steel Works, Tinsley, Sheffield | Askham, Sheffield (Tramway) | Sheffield 41055 |
| Allen Liversidge, Ltd. | Victoria Station House, S.W.1 | Aceterator, Sowest, London | Victoria 9226 |
| Aluminium (II), Ltd. | Bush House, Aldwych, London, W.C.2 | Alutwo, Estrand, London | Temple Bar 8844 |
| Anderson Mfg. Co., Albert & J. M. | 12, Moor Lane, London, E.C. | Aetnaco, Barb, London | Metropolitan 2882 |
| Armstrong, Stevens & Son, Ltd. | Whittall Street, Birmingham | Armstrongs, Birmingham | Birmingham 6148 |
| Associated Equipment Co., Ltd. (A.E.C.) | Windmill Lane, Southall 23, Middlesex | Vangastow, Southall | Southall 1502 (17 lines) |
| Attwater & Sons | Hopwood Street Mill, Preston | Attwaters, Preston | Preston 1045 (2 lines) |
| Auto-Tickets, Ltd. | Laird Street, Birkenhead | Extension, Birkenhead | Birkenhead 1453 |
| Avon India Rubber Co., Ltd. | Melksham, Wilts | Rubber, Melksham | Melksham 71-74 |
| Baker & Bessemer, Ltd., John | Brinsworth Works, Rotherham | Brinsworth, Rotherham | Rotherham 89 and 435 |
| Bell Punch & Printing Co., Ltd. | The Island, Uxbridge | Belpunch, Uxbridge | Uxbridge 460-2 |
| B.E.N. Patents, Ltd. | 92, Tottenham Court Road, London, W.1 | Tooinwun, Wesdo, London | Museum 1761-62 |
| Birkbys, Ltd. | Liversedge, Yorks | Woodfield, Liversedge | Cleckheaton 103 |
| Brecknell, Willis & Co., Ltd. | Jacob Street, Bristol | Brecknell, 'Phone, Bristol | Bristol 9344 |
| Brill Co., The, J. G. | Aldwych House, Aldwych, London, W.C.2 | Axles, London | Holborn 6344 |
| Bristol Tramways & Carriage Co., Ltd. | Motor Sales Department, Bristol | Automobile, Bristol | Bristol 4260 |
| British Aluminium Co., Ltd. | Adelaide House, King William Street, E.C.4 | Cryolite, Bilgate, London | Mansion House 5561 |
| British Dardelet Threadlock, Ltd. | Chase Road, London, N.W.10 | — | Willesden 6616 (3 lines) |
| British Insulated Cables, Ltd. | Prescot, Lancs | Insulator, Prescot | Prescot 171 |
| British Thomson-Houston Co., Ltd. | Rugby | Asteroidal, Rugby | Rugby 286 |
| Brown & Sons, Ltd., David | Park Works, Lockwood, Huddersfield | Gearing, Huddersfield | Huddersfield 3500 (4 lines) |
| Brown & Co., Ltd., John | Atlas Works, Sheffield | Atlas, Sheffield | Sheffield 20001 |
| Brush Electrical Engineering Co., Ltd. | Falcon Works, Loughborough | Falcon, Loughborough | Loughborough 624 |
| Butcher & Co., Ltd., J. H. | Moseley Road, Birmingham | Solito, Birmingham | Birmingham South 383 |
| Cameron & Sons, John | Silvermills, Edinburgh | Leather, Edinburgh | Edinburgh 26887 |
| Clough, Smith & Co., Ltd. | 36, Victoria Street, London, S.W.1 | Clufmit, Sowest, London | Victoria 7937 |
| Commer Cars, Ltd. | Biscot Road, Luton | Komerkars, Luton | Luton 192 |
| Connolly Bros. (Curriers), Ltd. | Chalton Street, Euston Road, London, N.W.1 | Cowhide, Phone, London | Museum 3437 (4 lines) |
| Consolidated Pneumatic Tool Co., Ltd. | Egyptian House, 170, Piccadilly, W.1 | Caulking, Piccy, London | Gerrard 9215 (4 lines) |
| Cooper, Webb-Jones & Co. | Stockwell Works, Walsall, Staffs | Stockwell, Walsall | Walsall 3890 |
| Courtenay, J. W., Ltd. | Amberley House, Norfolk Street, W.C.2 | Tramigro, Estrand, London | Temple Bar 7630 |
| Crossley Motors, Ltd. | Gorton, Manchester | Motors, Gorton | Manchester City 4611 |
| Cuxson, Gerrard & Co., Ltd. | Oldbury, near Birmingham | Dressings, Oldbury | Oldbury 355 (2 lines) |
| Dennis Bros., Ltd. | Woodbridge Works, Guildford | Dennis, Guildford | Guildford 1575 (6 lines) |
| Diamond Fibre Co., Ltd. | 79, Knightrider Street, London, E.C.4 | Dymofyber, Cent, London | Central 7873 |
| Dick & Co., Ltd., W. B. | 26, Grosvenor Gardens, London, S.W.1 | Dicotto, Sowest, London | Sloane 3461 (5 lines) |
| Docker Brothers, Ltd. | 4 & 6, Moor Lane, Moorgate St., London, E.C.2 | Matured, London | Metropolitan 2775 |
| Eagle Transfer, Ltd. | Eagle Works, Spring Road, Hall Green, B'ham | Eagtranco, Birmingham | Acocks Green 1416 |
| Edison Accumulators, Ltd. | 15, Upper George Street, London, W.1 | Edibatt, Edge, London | Paddington 5120 |
| Edison Swan Electric Co., Ltd. | 155, Charing Cross Road, London, W.C.2 | — | Gerrard 5914 |

(*Continued on page iv.*)


## J. W. COURTENAY, Ltd.

TRAMWAY AND OMNIBUS ADVERTISING CONTRACTORS

ESTABLISHED HALF A CENTURY

Liverpool Corporation Tramways
Birmingham Corporation Tramways & Omnibuses
Portsdown & Horndean Light Railway Co.
Calcutta Tramways Company
Delhi Electric Tramways
Newcastle-on-Tyne Corporation Tramways & Omnibuses
Burton-on-Trent Corporation Tramways
Scarborough Electric Tramways Co.
Hastings & District Electric Tramways Co
Gosport & Fareham Tramways Co.
Doncaster Corporation Tramways
Gloucester Corporation Light Railways
Mandalay Electric Tramways
Ilford Corporation Tramways
Halifax Corporation Tramways
Exeter Corporation Tramways
Rotherham Corporation Tramways & Omnibuses
Dundee, Broughty Ferry & District Tramways Co
Barrow-in-Furness Corporation Tramways
Yorkshire (West Riding) Electric Tramways Co., Ltd
Maidstone Corporation Tramways
Croydon Corporation Tramways
Stockton & Thornaby Corporation Joint Tramways
Stockton Corporation Omnibuses
Cawnpore Electric Tramways
St. Helens Corporation Tramways
Scarborough Omnibuses
Ipswich Corporation Tramways
Derby Corporation Tramways
Portsmouth & Hambledon Omnibuses
West Riding Automobile Co., Ltd.
Newport Corporation Tramways & Omnibuses
Dearne District Light Railways
Leeds & Wakefield Omnibuses
Huddersfield and District Omnibuses
Southampton Corporation Omnibuses

AMBERLEY HOUSE, NORFOLK STREET, LONDON, W.C.2.
Telephone: Temple Bar 7630. Telegrams: "Tramigro, London."

## Yorkshire Switchgear & Engineering Co., Ltd.

ELECTRICAL AND TRAMWAY ENGINEERS

OVERHEAD LINE MATERIALS AND SUPPLIES.

Sole Manufacturers of
TURNER'S PATENT AUTOMATIC POINT CONTROLLERS.

Telegrams: "Controller, Leeds." Telephone: 51038 & 51039 Headingley
GROVE MILLS, MEANWOOD, LEEDS.

London Office: 103, CANNON STREET, E.C.4.
Telephone: City 3014. Telegrams: "Tramsuplim, Cannon, London."

## Electric Tramcar Handbook

FOR

MOTORMEN, INSPECTORS AND DEPOT WORKERS

By W. A. AGNEW

132 pages, 7 in. by 4½ in. Price 2s. 0d. Postage 2d.

THE TRAMWAY & RAILWAY WORLD OFFICES
Amberley House, Norfolk Street, W.C 2


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Continued from page iii

## Advertisers in the Illustrated Issues of "The Tramway and Railway World."

| Name of Company or Firm | Address | Telegraphic Address | Telephone No. |
|---|---|---|---|
| **Electro-Mechanical Brake Co., Ltd.** | Eagle Works, West Bromwich | Brakes, West Bromwich | West Bromwich 291 |
| **English Electric Co., Ltd.** | Queen's House, Kingsway, London, W.C.2 | Enelectico, Westcent, London | Holborn 6966 (10 lines) |
| **English Steel Corporation, Ltd.** | Vickers Works, Sheffield | Steelcorpo, Sheffield | Sheffield Attercliffe 41071 |
| **Equipment & Engineering Co., Ltd.** | 2 & 3, Norfolk St., Strand, London, W.C.2 | Kharparts, Estrand, London | Temple Bar 1088 (2 lines) |
| **Ferodo, Ltd.** | Chapel-en-le-Frith | Friction, Chapel-en-le-Frith | Chapel-en-le-Frith 19 |
| **Forest City Electric Co., Ltd.** | 4, Longford Road, Stretford, Manchester | Rolldrop, Manchester | Trafford Park 828 |
| **Garrett & Sons, Ltd., Richard** | Aldwych House, Aldwych, London, W.C.2 | Garleis, Estrand, London | Holborn 4822 |
| **Gilford Motor Co., Ltd.** | Holloway Road, N.7 | Gilfomotor, Holway, London | Archway 2646 (4 lines) |
| **Glasgow Numerical Printing Co., Ltd.** | 31, Finnieston Street, Glasgow, C.3 | Tickets, Glasgow | Glasgow Central 6350-1 |
| **Gledhill-Brook Time Recorders, Ltd.** | 153, Empire Works, Huddersfield | Time, Huddersfield | Huddersfield Cent. 1069 |
| **Gliksten & Son, Ltd., J.** | Carpenters Road, Stratford, E.15 | Gliksten, Phone, London | East 3771 |
| **Goodyear Tyre & Rubber Co, Ltd.** | Wolverhampton | Gotyruco, Wolverhampton | Wolverhampton 2321 |
| **Guy Motors, Ltd.** | Fallings Park, Wolverhampton | Guymo, Wolverhampton | Wol'hpton 1141 and 1142 |
| **Hadfields, Ltd.** | East Hecla Works, Tinsley, Sheffield | Hadfield, Sheffield | Sheffield 750, 2628, 2638 |
| **Halley Motors, Ltd.** | Yoker, Glasgow | Horseless, Glasgow | Clydebank 296 |
| **Hart & Sons, John T.** | Wright's Buildings, Grange Rd., Bermondsey | Jonarson, London | Bermondsey 1925 |
| **Henley's Tyre & Rubber Co., Ltd.** | 20-22, Christopher Street, London, E.C.2 | Hetewocol, Finsquare, London | Bishopsgate 8294 |
| **Hoffmann Manufacturing Co., Ltd.** | Chelmsford | Hoffman, Chelmsford | Chelmsford 151 |
| **Holroyd & Co., Ltd., John** | Milnrow, near Rochdale | Knit, Phone, Milnrow | Milnrow, 5322-5323 |
| **Hurst, Nelson & Co., Ltd.** | Motherwell, Scotland | Nelson, Motherwell | Motherwell 258 |
| **James, Ltd., Geo. O.** | Albion Works, Cookridge Street, Leeds | Wearwell, Leeds | Leeds 25344 |
| **Johnson & Phillips, Ltd.** | Charlton, London, S.E.7 | Juna, Charlton, London | Greenwich 0400 |
| **Johnston, Ltd., George** | 173, Shaftesbury Avenue, London, W.C.2 | Slapjack, Westcent, London | Temple Bar 1803 |
| **Karrier Motors, Ltd.** | Karrier Works, Huddersfield | Karriakar, Huddersfield | Huddersfield 1441 |
| **Kaye & Sons, Ltd., Joseph** | Lock Works, Leeds | Wedge, Leeds | Leeds 21855 |
| **Kearsley & Co., Ltd., Robert** | Ripon, Yorks | Kearsley, Ripon | Ripon 5 |
| **Leyland Motors, Ltd.** | Leyland, Lancs | Leymotors, Leyland | Leyland 200 (3 lines) |
| **Lodge Plugs, Ltd.** | St. Peter's Road, Rugby | Lodge, Rugby | Rugby 276-277 |
| **London Electric Wire Co. & Smiths, Ltd.** | Playhouse Yard, Golden Lane, E.C.1 | Electric, London | Clerkenwell 1388 |
| **London General Omnibus Co., Ltd.** | 55, Broadway, London, S.W.1 | Passengers, Sowest, London | Victoria 6800 |
| **London Oil Refining Co.** | Lorco Works, Croft St., Clayton, Manchester | Lorco, Manchester | Manchester East 0283-4 |
| **McGeoch & Co., Ltd., Wm.** | 46, Coventry Road, Birmingham | McGeoch, Birmingham | B'ham, Victoria 2174-5 |
| **McLaren, Ltd., J. & H.** | Midland Engine Works, Leeds | McLaren, Leeds | Leeds 24263 |
| **Main & Co., Ltd., A. & J.** | Clydesdale Iron Works, Possil Park, Glasgow | Kelvin, Glasgow | Glasgow Douglas 3014 |
| **Maley & Taunton, Ltd.** | King's Hill, Wednesbury | Emantee, Wednesbury | Darlaston 154 |
| **Manchester Armature Repair Co., Ltd.** | Ford Lane, Pendleton, Manchester | Rewinding, Manchester | Pendleton 151 |
| **Mather & Platt** | Park Works, Manchester | Mather, Manchester | Manchester City 6200 |
| **Maudslay Motor Co., Ltd.** | Parkside, Coventry | Maudslay, Coventry | Coventry 3111 |
| **M.C.L. & Repetition, Ltd.** | Pool Lane, Langley, Birmingham | Karlyteko, Langley, Worcs | Blackheath 1115 |
| **Metropolitan-Vickers Electrical Co., Ltd.** | Trafford Park, Manchester | Metrovick, Manchester | Trafford Park 190 (8 lines) |
| **Metro-Vick Supplies, Ltd.** | 155, Charing Cross Road, London, W.C.2 | Emveesuply, Westcent, London | Gerrard 5901 |
| **Miller & Co., Henry** | Mileometer Works, Walmer Road, W.11 | Hubodmeter, Nottarch, London | Park 8408-8409-8410 |
| **Municipal Tramways and Transport Assoc.** | 3 & 4, Clement's Inn, Strand, London, W.C.2 | Munitrams, Phone, London | Holborn 1653 |
| **Murex, Ltd.** | Rainham, Essex | Murex, Rainham | Rainham 240-2 |
| **National Rail & Tramway Appliances Co., Ltd.** | 12-18, Taylor Street, Liverpool | Brakeblock, Liverpool | L'pool North 1198 |
| **Nesta, Ltd.** | Brunswick Square, Tottenham, N.17 | Sideslip, Tottlane, London | Tottenham 3061 |
| **Newsum, Sons & Co., Ltd., H.** | Gainsborough | Newsums, Gainsborough | Gainsborough 171 & 172 |
| **Park Royal Coachworks, Ltd.** | Abbey Road, Park Royal, N.W.10 | Koachwork, Harles, London | Willesden 5841-5 |
| **Peckham Truck & Engineering Co., Ltd.** | Stafford House, Norfolk Street, W.C.2 | Truxenpeck, Estrand, London | Temple Bar 8675 |
| **Peters & Co., Ltd., G. D.** | 3, Central Bldgs., Westminster, S.W.1 | Peters, Parl, London | Victoria 2900, 2901 |
| **Pirelli, Ltd.** | 144, Queen Victoria Street, London, E.C.4 | Pirellicon, Cent, London | Central 3662 |
| **Plascom (1909), Ltd.** | 246, Willenhall Road, Wolverhampton | Plascom, Wolverhampton | Wolverhampton 865 |
| **Quasi-Arc Co., Ltd.** | 15, Grosvenor Gardens, London, S.W.1 | Quazarc, London | Victoria 6236-7 |
| **Quicktho (1928), Ltd.** | Point Pleasant, Wandsworth, S.W.18 | — | Putney 5077 |
| **Quilliam, Ltd.** | 12, College Lane, Liverpool | Gunny, Liverpool | Liverpool Royal 5450 |
| **Rail Welding Co.** | 13, Victoria Street, London, S.W.1 | Weltrajont, Sowest, London | Victoria 1363 |
| **Ransome & Marles Bearing Co., Ltd.** | Newark-on-Trent | Bearings, Newark | Newark 170-1 |
| **Ransomes, Sims & Jefferies, Ltd.** | Orwell Works, Ipswich | Ransomes, Ipswich | Ipswich 2201 (4 lines) |
| **Rawlings Manufacturing Co., Ltd.** | 1/11, Larch Road, Balham, London, S.W.12 | Rawcolifts, Phone, London | Streatham 1645 & 1646 |
| **Roe, Ltd., Chas. H.** | Crossgates, Leeds | Vehicles, Leeds | Crossgates 93 (2 lines) |
| **Safety Tread Syndicate, Ltd.** | Dace Road, London, E.3 | Unslipping, Hackwick, London | East 6226 |
| **Short Bros. (Rochester & Bedford), Ltd.** | Seaplane Works, Rochester | Seaplanes, Rochester | Chatham 2261 |
| **Siddall & Hilton, Ltd.** | 92, Victoria Street, London, S.W.1 | Bricastan, Sowest, London | Victoria 6186 |
| **Smith & Co., Frederick** | Anaconda Works, Salford, Manchester | Anaconda, Manchester | Manchester Central 4640 |
| **Spicers, Ltd.** | 19, New Bridge Street, E.C.4 | Nykoping, Lud, London | City 6251 |
| **Standard Telephones & Cables, Ltd.** | Columbia House, Aldwych, London, W.C.2 | Relay, Estrand, London | Holborn 8765 (15 lines) |
| **Standard Underground Cable Co.** | Dock House, Billiter Street, London, E.C.3 | Gramercy, London | Monument 3571 |
| **Strachans (Acton), Ltd.** | Wales Farm Road, North Acton, W.3 | Strobus, Phone, London | Chiswick 3848-51 |
| **Sunsaloon Bodies, Ltd.** | Castleford Road, Sparkhill, Birmingham | Sunsabod, Birmingham | B'ham Victoria 1283, 1284 |
| **Tangyes, Ltd.** | Cornwall Works, Birmingham | Tangyes, Birmingham | Smethwick 0340 |
| **Tearne & Sons, Ltd.** | All Saints' Road, Birmingham | Tearne, Birmingham | B'ham, Northern 1637 |
| **Thornley & Knight, Ltd.** | Bordesley Green Road, Birmingham | Thornley, Birmingham | B'ham, Victoria 50 |
| **Thornycroft & Co., Ltd., John I.** | Thornycroft House, Smith Square, S.W.1 | Thornycroft, Vic., London | Victoria 8000 |
| **Titan Trackwork Co., Ltd.** | Rutland Road, Sheffield | Crossings, Sheffield | Sheffield Central 798 |
| **Tramways & Light Railways Association** | 50, Abbey House, Victoria Street, S.W.1 | Tralitrayl, Vic., London | Victoria 2110 |
| **Tramway & Railway World** | Amberley House, Norfolk Street, W.C.2 | Tramigro, Estrand, London | Temple Bar 2948 |
| **Trist & Co., Ltd., Hubert H. P.** | Bristol | Specialities, Bristol | Bristol 5593 |
| **T.S. Motors, Ltd.** | 5, Iddesleigh House, Caxton St., London, S.W.1 | Petelobus, Sowest, London | Victoria 9932-9933 |
| **Tucker Armoured Plywood Co., Ltd.** | Creek Mills Ply Works, Crayford | Cemented, Crayford | Bexley Heath 860 |
| **Tyne Metal Co., Ltd.** | Hexham-on-Tyne | Floating, Hexham | Hexham 189 |
| **Underground Electric Railways Co. of London** | 55, Broadway, London, S.W.1 | Passengers, Sowest, London | Victoria 6800 |
| **United States Steel Products Co.** | 36-38, New Broad Street, London, E.C.2 | Steelmaker, London | London Wall 8186 |
| **United Steel Companies, Ltd.** | The Ickles, Sheffield | Unisteels, Sheffield | Sheffield 60081 |
| **Vandervell & Co., Ltd., C. A.** | Acton Vale, London, W.3 | Vanteria, Act, London | Chiswick 3801 |
| **Vulcan Motor & Engineering Co., Ltd.** | Crossens, Southport | Vulcan, Southport | Southport 87101 |
| **Westinghouse Brake & Saxby Signal Co., Ltd.** | 82, York Road, London, N.1 | Westinghouse, Kincross, London | North 2404-2415 |
| **Westinghouse Electric International Co.** | 2, Norfolk Street, London, W.C.2 | Wemcoexpo, London | Temple Bar 3883 |
| **Wiseman, Ltd., Alfred** | Glover Street, Birmingham | Verus, Birmingham | B'ham, Victoria 2216-2217 |
| **Woodhead & Sons, Ltd., Jonas** | Kirkstall Road, Leeds | Forge, Leeds | Leeds 20814 & 20815 |
| **Yorkshire Switchgear & Engineering Co., Ltd.** | Grove Mills, Meanwood, Leeds | Controller, Leeds | Headingley 51038 |
| **Youngs** | Ryland Street Works, Birmingham | Oldens, Birmingham | Edgbaston 2301 |

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The Offices of THE TRAMWAY AND RAILWAY WORLD are at Amberley House, Norfolk Street, London, W.C.2.

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